Y2K Risk and Compliance Assessment For Radioisotope Licensing

AECB Project 6.549.1

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Executive Summary

As part of theY2K readiness and assessment program of the AECB, a risk and compliance assessment of selected licensees, devices and activities was performed. In all, the responses of 351 licensees responding to a Y2K self-assessment questionnaire were reviewed, leading to a more detailed review of 125 licensees, as selected by a defined set of flagging criteria.

This second level of review has resulted in the assignment of risk categories which can be used to direct subsequent AECB licensee Y2K readiness and assessment efforts. In particular, the 55 licensees determined to lie in high risk categories are recommended for a third level of review.

A set of recommendations has resulted from the work undertaken during this project.

Recommendations

1. The 55 high risk licensees should be examined in further detail.
2. The seven Prescribed Substance Licences should be examined.
3. The four licensees for whom device analysis was not carried out should be examined.
4. Manufacturers, consolidated license holders and gauge users should be contacted regarding their activities.
5. Licensees possessing any of the 11 identified devices and/or device classes should be monitored.
6. The 62 specifically identified licensees should be contacted regarding their responses, and follow-up information required.
7. Vendor or other device specific Y2K information should be placed in the device files.
8. Licensee provided Y2K information (test plans, responses to form, etc.) should be placed in the license files.
9. The qualitative risk analysis process used in this project should be extended, in conjunction with collection of additional information from the licensees, to permit a more quantitative risk analysis to be performed.
10. The contingency plans for the 55 licensees and 11 devices identified as being high risk should be reviewed in detail. The contingency plans as a minimum should include the elements specified in Appendix D of this report.
11. MRD has initiated a detailed and ongoing Y2K risk management program. Several follow-up steps are required to monitor and maintain this program: (a) the missing licensee responses should be obtained and reviewed; (b) the 34 licensees who responded that they had a Y2K risk should be reviewed in detail; (c) all license modifications/revisions should specifically reviewed for Y2K implications.
12. Due to the time limitation, further discussions with licensees should be accelerated in terms of the level of detail requested from the licensee (see also Task 3 below).
13. If further licensees are subject to a first level review, the use of a modified Year 2000 Response Form should be considered.
14. In light of the inconsistencies in their responses, all medical accelerator and therapy unit licensees who responded that they did not have a Y2K risk should be required to provide detailed supporting information.

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1.0 Introduction

The Atomic Energy Control Board (AECB) has a mandate to ensure the safe operations of its licensees. This includes the routine operation by these licensees of various medical, industrial and other radiation-related devices. While some of these devices are of the analog variety, others are digital in nature and therefore may be subject to the Year 2000 (Y2K) problem. Due to the potential for harm to operators, the public or the environment arising out of Y2K malfunctions, the AECB has a requirement to perform a Y2K compliance evaluation of these licensed devices.

In executing this project, a number of specific tasks have been performed in support of achieving five key objectives, within the scope of licensed activities as specified by MRD.

1.1 Background

Materials Regulation Division (MRD) staff have completed a preliminary assessment of the risks posed by the transition from 1999 to the Year 2000 (Y2K) and beyond for activities involving radioisotopes and radiation devices. Based on the significance of risk, licensees deemed at risk have been informed of their responsibility to see to it that public and worker health, safety and security, the environment, as well as regulatory compliance are not compromised due to Y2K-related problems. These licensees have been asked to demonstrate Y2K-readiness by submitting information on their programs.

The initial responses from licensees, indicating their views on whether Y2K is an issue or not for their licensed activities or devices, have been received. To adequately assess the licensees' responses, their Y2K programmes and readiness, MRD staff need information on the Y2K-risk profiles of the activities and devices regulated by the MRD. The results of this project, will provide staff with information upon which sound judgements on Y2K risk and licensee readiness can be made.

2.0 Objectives, Scope and Tasks

2.1 Objectives

The objectives of MRD in performing this work are:

- Objective 1: To perform a risk and compliance assessment of selected devices approved by the Materials Regulation Division of the Atomic Energy Control Board (AECB).
- Objective 2: To perform a Y2K risk assessment of selected activities licensed by the AECB.
- Objective 3: To identify licensees requiring scrutiny and more stringent oversight with respect to Y2K issues.
- Objective 4: To develop Y2K risk profiles and a repository of Y2K-related information on the activities and devices licensed by the MRD.
- Objective 5: To generate information that may be used in the development of contingency plans for dealing with Y2K-related incidents.

2.2 Scope

The scope of this project has been established by MRD staff as follows:

- The scope of the project will cover all licensed activities and radiation devices pertaining to the 443 licensees identified by MRD staff as warranting close scrutiny based on the potential harm arising from a Y2K malfunction in their operations.
- Time and funding allowing, the scope will be expanded to include any other areas identified in the course of this project as requiring further evaluation and analysis.

2.3 Tasks

The specific tasking requested by MRD was:

- Task 1: Familiarise project staff with the licensed activities and devices lying within the scope of this project.
- Task 2: Review the approach that the MRD has taken to address licensee Y2K-readiness.
- Task 3: Perform a preliminary review of the devices and activities and classify them in terms of susceptibility to Y2K-related problems.
- Task 4: Review the documents that the MRD has sent to licensees on Y2K in accordance with the MRD Y2K Action Plan.
- Task 5: Review and compare the responses of licensees to the Y2K survey form.
- Task 6: Based on the review of task 5, identify any inconsistencies and the licensees, devices or manufacturers that require special attention and follow-up.
- Task 7: Review devices, licensees or activities requiring closer scrutiny for Y2K compliance or readiness, as the case may be.
- Task 8: Liase with MRD staff, licensees, manufacturers, and AECB contracted resources on a routine basis to obtain information or to communicate findings.
- Task 9: Prepare status reports indicating the progress of the project and highlighting significant findings and any glaring problems.
- Task 10: Prepare a final project report.

3.0 Methodology

3.1 Methodology for Achieving Objectives

Objective 1: ***To perform a risk and compliance assessment of selected devices approved by the Materials Regulation Division of the Atomic Energy Control Board (AECB).***

and

Objective 2: ***To perform a Y2K risk assessment of selected activities licensed by the AECB.***

A qualitative risk analysis has been performed for 125 of the licensees selected by the AECB. The criteria used in performing this analysis were:

Risk Element	Specific Factor	Rating
Consequence	Below target level of safety.	Low
	At or above target level of safety.	High
Probability	Device has no digital assets.	No risk
	Y2K compliance positively indicated.	No risk
	No date related processing performed.	Negligible
	Identified non-compliance with no safety issue.	Negligible
	Identified non-compliance with possible safety issue.	High
	Large number of devices or activities within a given class.	High
	Unique or custom device/supplier, licensee or activity.	High

A compliance assessment was performed for devices supplied by 10 vendors for which Y2K statements were obtained. In this assessment, the vendor compliance statements were ranked as:

- Accepted for all devices supplied by vendor without conditions.
- Accepted, pending confirmation of vendor test plan and results.
- Rejected (e.g. for lack of information, device not covered, insufficient test plan/results).
- Indicates need for device by device review.
- Indicates need for review of specific configuration in use by licensee.

Objective 3: ***To identify licensees requiring scrutiny and more stringent oversight with respect to Y2K issues.***

Flagging criteria based on risk indicators utilised in Tasks 6 and 7 were used to identify licensees with potential Y2K issues.

Objective 4: ***To develop Y2K risk profiles and a repository of Y2K-related information on the activities and devices licensed by the MRD.***

Risk profiles were developed according to the following criteria:

- Can the response of the licensee be accepted or should the response be flagged?
- Do the devices covered by the license contain digital assets?
- Has Y2K compliance been positively indicated for this device?
- Is the source within the device capable of exceeding the target level of safety established by MRD? Specifically, can a dose in excess of 1.0 mSv be received within 8 hours of exposure to the source at a distance of 1 meter?

A flow diagram of this process is presented in Figure 3-1.

A repository containing the following information has been assembled:

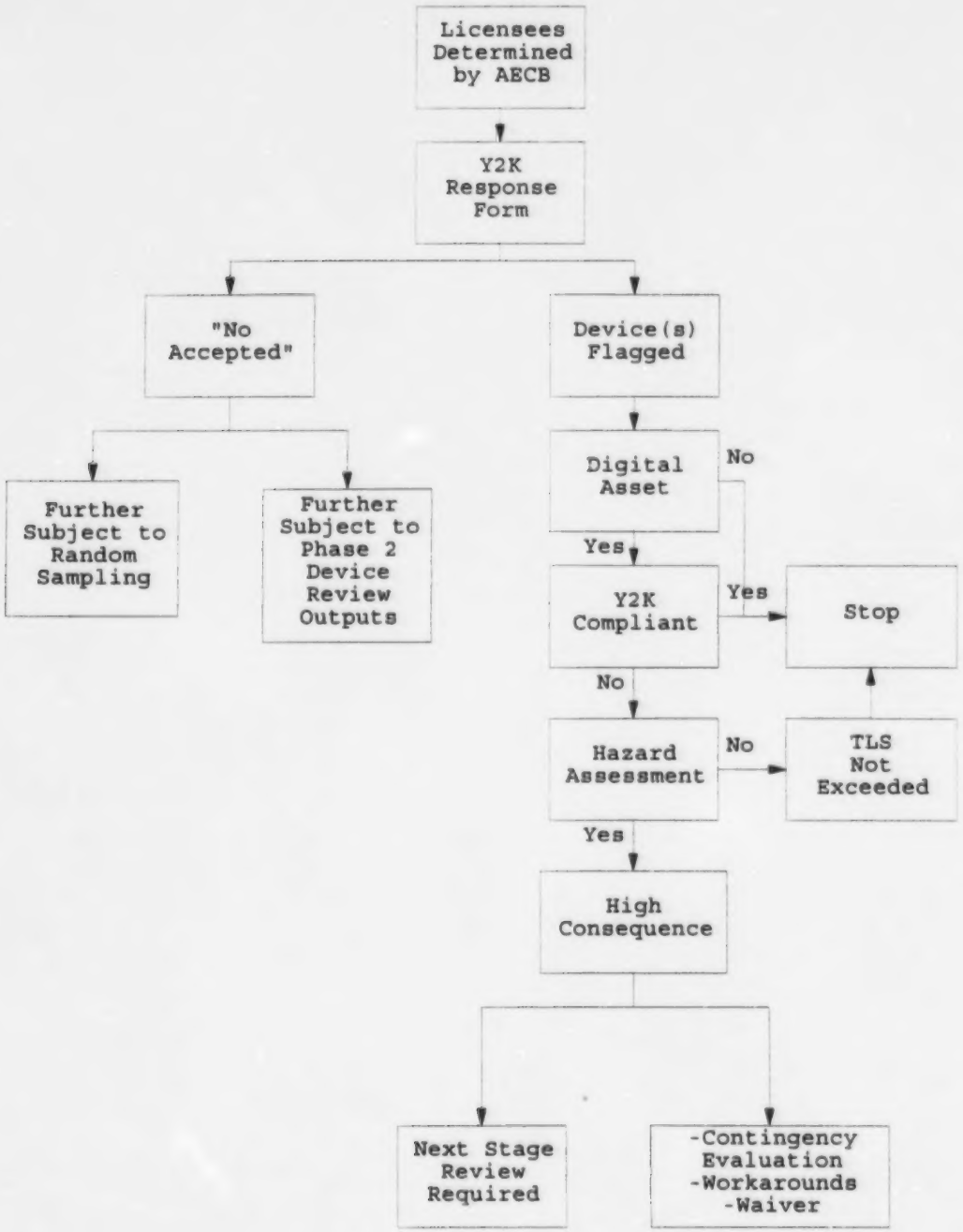
- The radiological hazards associated with approximately 125 of the licensees lying within the scope of this project were tabulated.
- Available vendor compliance statements for devices within the scope of this project.

Objective 5: ***To generate information that may be used in the development of contingency plans for dealing with Y2K-related incidents.***

The following information was prepared:

- Possible work-arounds for dealing with certain Y2K-related failures have been compiled.
- A detailed Y2K compliance questionnaire was developed. The questionnaire contains a complete list of conditions and specific date tests which licensees and/or manufacturers must consider. When used in conjunction with contingency plans or test data submitted by a licensee, it can be used to gauge the level of Y2K preparedness of a licensee. As a stand-alone document, it clearly identifies the list of trigger events which can lead to Y2K-related failures.
- The critical elements of a Y2K contingency plan are presented.

Figure 3-1: Flow Diagram for Establishing Y2K Risk Profiles of Licensees and Devices



3.2 Methodology for Accomplishing Tasks

Task 1: Familiarise project staff with the licensed activities and devices lying within the scope of this project.
The following information was assembled and reviewed:

- Full list of devices in ILS.
- Listing of the 443 licensees contacted, including license number, organisation, and contact. This information was supplemented with the name of the License Assessment Officer responsible for the licence and the risk classification index assigned by the AECB to this license. This information is contained in a spreadsheet which accompanies this report.

In addition, the team:

- Reviewed 125 licensee files and approximately 100 device files pertaining to licensees' devices within the scope of this project.
- Had conversations with six LAOs regarding the activities, licensees and devices assigned to them

Task 2: Review the approach that the MRD has taken to address licensee Y2K-readiness.
The following material was reviewed:

- BMD 98-167, "Year 2000 Preparedness (Licensees).
- Licensed Activity Categories review of risk and complexity.
- "Radioisotopes and Radiation Devices Y2K Programme" presentation to MRD Inspectors.

Task 3: Perform a preliminary review of the devices and activities and classify them in terms of susceptibility to Y2K-related problems.
Devices and activities were reviewed and classified according to the following criteria:

- Are digital assets involved? Are the devices or activities computer controlled? Can the devices or activities be computer controlled? This latter criterion is added to cover the case where a device can be modified in the field to convert it from manual to computer control.
- Has Y2K compliance been confirmed?
- Is date-related processing performed?
- Can the target level of safety be exceeded?

The process followed in performing the classification is presented in Figure 3-2. From this process, qualitative susceptibility rankings are obtained as: none, negligible, low or high.

Task 4: Review the documents that the MRD has sent to licensees on Y2K in accordance with the MRD Y2K Action Plan.
The following documents were reviewed:

- AECB Reporter Spring 1997
- AECB Information Bulletin 98-07.
- AECB Reporter Summer/Fall 1998, article on "Y2K readiness".
- "Year 2000 Readiness and Radiation Safety" letter, "Year 2000 Response Form" and "Year 2000 Plan of Action" sheets sent to selected licensees.

Task 5: Review and compare the responses of licensees to the Y2K survey form.

- The licensee responses were gathered and sorted by LAO.
- Each form was reviewed for completion and for any annotations or attached material.
- Statistics relating to the responses were gathered:
  - Number of responses received.

- Number of "Yes" and "No" responses.
- Number of incomplete responses.
- Number of ambiguous responses.

- Licensees were flagged, based on the criteria discussed in Tasks 6 and 7. Flagged licensees were the subject of a detailed examination of the activities, sources and devices covered by each license.

Task 6: Based on the review of task 5, identify any inconsistencies and the licensees, devices or manufacturers that require special attention and follow-up.

Each response was reviewed according to the following consistency criteria:

- External consistency: Were the responses by licensees consistent for a given device?
- Internal consistency: In the case where organisations held more than one license, were their responses consistent?

External inconsistencies indicate potential problems with licensees, devices and manufacturers, whereas internal inconsistencies indicate potential problems with specific licensees or activities.

Task 7: Review devices, licensees or activities requiring closer scrutiny for Y2K compliance or readiness, as the case may be.

In addition to the consistency checks, devices, licensees and activities possessing the following risk indicators were flagged for further review:

- Incomplete response.
- Ambiguous response.
- "Yes" response.
- Legal response.
- High hazard device.
- Device contains a microprocessor.
- Test plan or information provided in support of response.
- Third party information provided in support of response.
- Device manufacturer.
- Poor licensee history.
- Device widely used (a "common" component or device).

Note that some devices, licensees and activities exhibit more than one risk indicator.

Task 8: Liase with MRD staff, licensees, manufacturers, and AECB contracted resources on a routine basis to obtain information or to communicate findings.

- A project start-up meeting was held.
- Four meetings were held with the contractor engaged to audit the MRD process.
- A written reply to a specific list of questions prepared by the auditor was prepared.
- In all, a total of approximately five meetings were held with MRD staff specifically concerning interim findings, planning and issues associated with this project.
- A meeting was held with MRD staff to discuss the draft final report.
- A seminar on the findings of the project was presented to AECB staff.

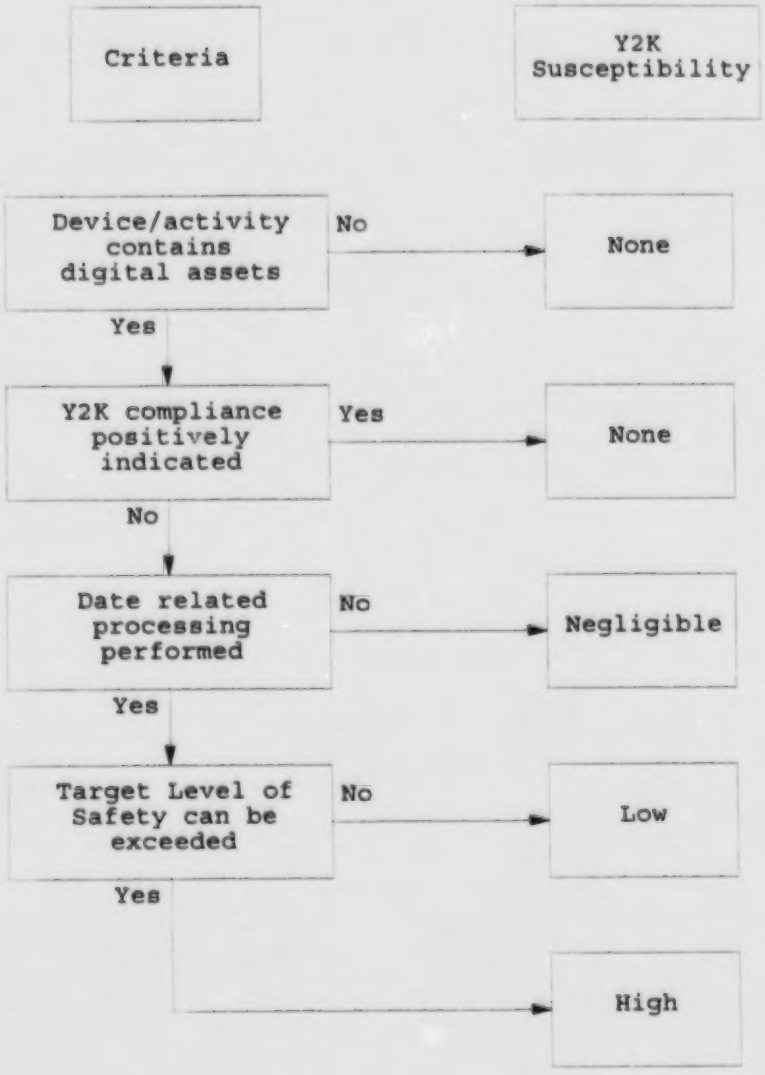
Task 9: Prepare status reports indicating the progress of the project and highlighting significant findings and any glaring problems.

Progress reports were submitted every two weeks.

Task 10: Prepare a final project report.

The results of Tasks 1-8 are included in this report.

Figure 3-2: Device and Activity Classification for Susceptibility to Y2K Related Problems



3.3 Task and Methodology Matrix

The relationship between the stated objectives and tasks is shown in Table 3-1.

Table 3-1: Relation of Objectives and Tasks

	Objective 1	Objective 2	Objective 3	Objective 4	Objective 5
Task 1					
Task 2					
Task 3					
Task 4					
Task 5					
Task 6					
Task 7					
Task 8					

Tasks 9 and 10 are not included since they are the reporting tasks.

4.0 Results and Findings

4.1 Objectives

Objective 1: ***To perform a risk and compliance assessment of selected devices approved by the Materials Regulation Division of the Atomic Energy Control Board (AECB).***

and

Objective 2: ***To perform a Y2K risk assessment of selected activities licensed by the AECB.***

Of the 443 licensees as selected by MRD, 125 licensees were identified as requiring additional examination. The examination performed here and as documented in Appendix B has resulted in the following findings:

Risk Profile	Number of Licensees
No risk: Closed or revoked licences.	3
Low risk: Below target level of safety or no digital control issues.	14
Low risk: High hazard, negligible Y2K susceptibility.	11
Medium risk: High hazard, Y2K susceptibility dependent on field configuration.	31
High risk: High hazard, custom/unique device or vendor history issues.	15
High risk: High hazard, identified or possible Y2K non-compliance.	40
Not assessed: Device not identified.	1
Not assessed: PSL.	7
Not assessed: Device requires further investigation.	3
Total	125

In cases where a licensee has multiple devices, the risk profile selected was that for the highest risk device.

Objective 3: ***To identify licensees requiring scrutiny and more stringent oversight with respect to Y2K issues.***

Based on a review of activities, the following licensee-types should be contacted:

- Manufacturers. Manufacturers typically possess a large number of sources, leading to potential access control issues. Further, as suppliers to licensees, they should be requested to provide detailed Y2K compliance statements for their products.
- Consolidated license holders. Consolidated license holders typically possess a large number of sources, leading to potential access control issues. Further, these licensees have the ability to modify their holdings, which results in possible documentation issues.
- Gauge users. Gauge users present special issues. These licensees typically hold a large number of licensed devices. While many of the devices within this class are nominally manual in nature, some devices can be modified in the field. Due to the large number of licensees (1255 licensees with portable or fixed gauges) and the large number of specific devices, it was only possible within the level of effort of this project to identify the broad issues here.

Based on a review of devices, licensees with the following devices should be monitored:

Device	Reason for Follow-Up
OCI Calitron and Hemitron	High dose rate, custom device with no information on Y2K compliance provided.
Nucletron units (Selectron and MicroSelectron)	Vendor identified compliance issues, depending on firmware.
Theratron units	Vendor information requires further Y2K details for older units. Possible vendor history issues.
Eldorado units	High dose rate, older units with possible field modification to include digital control.
Monserco Calcium Unit	Unable to assess due to lack of information.
Total Body Nitrogen Measurement Unit	Unable to assess due to lack of information.
JS-8900	High dose rate, unique device.
UC-15	High dose rate, unique device.
GammaBeam	High external fields possible. Access control and source manipulations issues.
GammMed 12I	Recent change in corporate ownership to Nordion. Unable to obtain vendor Y2K compliance information.
AECL 651PT	High dose rate, unique device.
Varian units	Vendor identified compliance issues, depending on hardware and software combination.
Philips units	Vendor identified compliance issues, depending on hardware and software combination.
AOL-779 Custom Proton Therapy Unit	High dose rate, custom device with no information on Y2K compliance provided.
AOL-812 Unidentified Device	Unable to determine device under license.
PSL Holders	Unable to assess within time-frame of current project.

Based on a review of the response forms, the following specific licensees should be contacted:

Licensee	Reason for Follow-Up
07347	Added "provided utilities are running".
11708, 11710, 11711, 01086 and 12008	Internal inconsistencies.
01043	Inconsistent for corporation size.
01824 and 01802	Internal inconsistencies. 1802 sent legal-type letter.
08180	Added "based on conversation with G. Lavoie".
12718	Sent legal-type letter.
02107 and 06469	Internal inconsistencies.
01362 and 12470	Internal inconsistencies.
5940 and 3080	Internal inconsistencies.
AOL-739	Attempted to include all 01832 licence responses on AOL-739 form.
02172, 12609-98BA, 12609-98BB, 12609-99A, 12609-99AG, 12609-99AK, 12609-99AM, 12609-99AU, 12609-99AW, 12609-99C, 11709, 11710, 01362, 12278-98T, 01764-97A, 01764-97C, 01179, 01186, 03738, AOL-764, AOL-766, AOL-777, AOL-783, AOL-791, AOL-793, AOL-798, AOL-800, AOL-715, AOL-703, AOL-734, AOL-701, PEA-772, PEA-784	Said "Yes"
12609-98-BE, 11718, 08826, ACA-795, AOL-801	Did not respond
01480, 01766, 04976, AOL-762, AOL-712	Ambiguous response

Objective 4: ***To develop Y2K risk profiles and a repository of Y2K-related information on the activities and devices licensed by the MRD.***

Appendix B presents the radiological hazards associated with approximately 125 of the licensees lying within the scope of this project.

Appendix F presents vendor compliance statements for devices within the scope of this project. In addition, information from the US FDA Y2K Biomedical Equipment Clearinghouse Data is presented.

Objective 5: ***To generate information that may be used in the development of contingency plans for dealing with Y2K-related incidents.***

Appendix C presents possible work-arounds for dealing with certain Y2K-related failures. It can be used in reviewing the contingency plans submitted by licensees, as well as in assisting licensees in developing such plans.

Appendix D presents a detailed Y2K compliance questionnaire. The questionnaire contains a complete list of conditions and specific date tests which licensees and/or manufacturers must consider. When used in conjunction with contingency plans or test data submitted by a licensee, it can be used to gauge the level of Y2K preparedness of a licensee. As a stand-alone document, it clearly identifies the list of trigger events which can lead to Y2K-related failures. This Appendix also contains an outline of the critical elements of a Y2K contingency plan.

4.2 Tasks

Task 1: Familiarise project staff with the licensed activities and devices lying within the scope of this project.
The licensed activities and devices within the scope of this project can be broadly defined in terms of the 5 categories as given in Appendix A. Of the 443 licensees selected by MRD for this project, the breakdown by risk level assigned by MRD is:

Risk Level	Number of Licensees
B1	37
B2	29
B4	45
B5	49
B8	8
B9	4
C4	5
C6	1
C7	14
D4	239
E1	11
E6	1
Total	443

When the surveyed licensed activity categories are weighted with the MRD assigned risk factors as given in Appendix A, the surveyed licensees represent a total risk indicator of 6671 out of a total risk indicator of 35710.

Task 2: Review the approach that the MRD has taken to address licensee Y2K-readiness.
MRD has established both internal and external programs for addressing licensee Y2K-readines. The external program is reviewed as part of Task 4. The more significant elements of the internal program are identified and discussed below.

1. BMD 98-167, "Year 2000 Preparedness (Licensees). This Board Memorandum Document clearly identifies:
   - The scope of the Year 2000 Technical Issues.
   - A comprehensive Year 2000 Strategy.
   - Review criteria for assessing Y2K readiness of licensees.
   - Graded approach to risk management.
   - Status report on Year 2000 preparedness of licensees.
   - National and international co-operation issues.
   - Program status as of 20 October 1998.
   - Next steps to be undertaken.
2. Licensed Activity Categories review of risk and complexity. This spreadsheet was developed to identify:
   - The major categories of licensed activities.
   - The sub-categories within each category.
   - The probability, hazard and complexity, as estimated by AECB staff, for each sub-category.
   - The resulting risk for each sub-category.
   - The effort (defined as the product of risk and complexity) required to analyse each sub-category.

   From these categorisations and the estimated risk and effort, the 443 licensees were selected for further review.
3. "Radioisotopes and Radiation Devices Y2K Programme" presentation to MRD Inspectors. Information was presented to inspectors to aid them in dealing with their assigned licensees:
   - Introduction to the Y2K problem.
   - Legal issues, including the liability of the AECB.

- Goal of the Y2K program.
- Graded approach to risk management.
- MRD action plan.
- Requirements and evaluation criteria.
- Roles and responsibilities.
- Status of Y2K license review program.

Task 3: Perform a preliminary review of the devices and activities and classify them in terms of susceptibility to Y2K-related problems.

Appendix B, Table B-2 presents the results of this review. A summary risk profile is presented in Section 4.1, Objective 2.

Task 4: Review the documents that the MRD has sent to licensees on Y2K in accordance with the MRD Y2K Action Plan.

The specific documents sent to the licensees are identified and commented on below:

1. AECB Reporter Spring 1997. An article entitled "Is that the Year 2000 or 1900?" was included. It served as an early reminder to licensees about the existence of the Y2K problem, and urged licensees to take prudent action to ensure that any safety implications are dealt with as early as possible. This article stressed the possible wide-spread nature of the problem, in that a wide range of potentially affected systems are suggested.
2. AECB Reporter Summer/Fall 1998. An article entitled "Y2K Readiness" was included. It serves as a general background piece on the issue, and introduces 30 June 1999 as the critical date by which any identified Y2K non-compliance issues must either be resolved or a contingency plan in place, and documentation relating to these requirements submitted to the AECB.
3. Information Bulletin 98-07, September 1998. The subject of this bulletin was "Year 2000 Readiness of Systems which may Affect the Safety of Activities Involving Prescribed Substances or Equipment". It serves to:
   - Identify the Y2K issue.
   - Clearly define the scope of the issue to include attached devices.
   - Re-state the 30 June 1999 date for confirmation of Y2K compliance.
   - Define the responsibilities of the licensees.
   - Specify minimum content for Y2K risk assessment and remedial programs.
   - Advise that selected licensees will be contacted.
   - Identify the AECB point of contact.
   - Provide web-related resources to assist licensees in their Y2K assessment preparedness efforts.
4. Year 2000 Readiness and Radiation Safety Cover Letter. This letter introduces items 4 and 5. It clearly identifies:
   - That the licensee was identified as requiring specific contact (as advised in Information Bulletin 98-07).
   - The requirement to complete, sign, date and return the form to the AECB.
   - For those licensees identifying a Y2K risk, the requirement to prepare a Y2K plan of action and submit it to the AECB by 31 March 1999.
   - For those licensees identifying a Y2K risk, the requirement to confirm problem identification and correction to the AECB by 30 June 1999.
5. Year 2000 Response Form. This is the form on which the licensees indicate, in Yes or No format by way of a checkbox, whether or not "Y2K is an issue".
6. Year 2000 Plan of Action. This document provides licensees with a list of criteria which the AECB will use to evaluate action plans as submitted by licensees. It clearly identifies the objectives and the minimum issues which must be addressed in the plan. In addition, it re-states the 31 March 1999 and 30 June 1999 deadlines for submission of action plans and confirmation of implementation, respectively.

Discussion

In these documents, the AECB has:

- Completed a multi-stage announcement of the requirements and responsibilities of licensees.
- Identified as early as 1997, the need for licensee action.
- Clearly identified the timetable and documentation required of the licensees.
- By inclusion of the Year 200 Response Form, defined the basis for licensees to communicate their self-view of Y2K risk.

Overall, this approach is complete and sound. The only area where suggestions for change is offered is on the Year 2000 Response Form itself, where the following comments are offered:

- It is difficult for reviewers to assess the quality of a simple Yes/No response, in terms of process by which the licensee arrived at their response.
- Modification of the form to require a second level of detail to justify the response of the licensee would have offered reviewers much more information on which to assess the quality, and in some cases the credibility, of the response.

Suggested additions to the Year 2000 Response Form are:

1. Are your licensed sources and/or devices capable in their normal operating configuration of delivering a dose to workers, the public or the environment in excess of 1 mSv in an 8 hour period? (Yes/No/Unknown)
2. Do your licensed sources and/or devices contain, exchange information with or have external control components which process digital information? (Yes/No/Unknown)
3. If you answered yes to question #2, is your device Year 2000 compliant as per the attached definition and testing criteria? (Yes/No/Unknown)
4. If your device is deemed to be Year 2000 compliant please provide a copy of the test criteria and results.
5. If your device is deemed to be non-Year 2000 compliant:

- Do you have a plan to make the device Year 2000 Compliant? (Yes/No). If yes, please provide a copy of the plan.
- Is there an acceptable and tested work-around (i.e. manual operation of the device versus computer controlled). If so please provide details of the work-around and test criteria and test results.

Task 5: Review and compare the responses of licensees to the Y2K survey form.

The analysis of the licensee response data has shown the following:

"Yes" Responses:	34
"No" Responses:	307
Ambiguous Response:	5
Incomplete Response:	5
Total Responses:	351
Missing Responses:	92

The raw response data is presented in Table B-1, Appendix B.

Task 6: Based on the review of task 5, identify any inconsistencies and the licensees, devices or manufacturers that require special attention and follow-up.

and

Task 7: Review devices, licensees or activities requiring closer scrutiny for Y2K compliance or readiness, as the case may be.

The combined flagging criteria for Tasks 6 and 7 have resulted in the identification of 125 licensees (out of 351 responses) requiring further information. A listing of the flagged licensees, flagging reason and licensed devices is presented in Table B-2, Appendix B.

Within the 125 flagged licensees, over 100 separate devices were reviewed. These devices are presented in Table B-3, Appendix B.

A summary of the devices, licensees and activities requiring further oversight was presented in Section 4.1, Objective 3.

4.3 Other Findings

During the review, it was noted that:

1. Several responses were received from licensees who were not sent the Year 2000 Response Form. This indicates a degree of pro-activity on their part. Such responses were received from Hydro Quebec, Louvicourt and M.R. Wright.
2. The contact names for numerous licensees were out of date.
3. Several corporate name changes had occurred.

5.0 Summary Recommendations

Based on the results and findings as discussed in Section 4, the following recommendations are offered.

5.1 Recommendations Arising From Objectives

Objective 1: ***To perform a risk and compliance assessment of selected devices approved by the Materials Regulation Division of the Atomic Energy Control Board (AECB).***

and

Objective 2: ***To perform a Y2K risk assessment of selected activities licensed by the AECB.***

Recommendation 1: The 55 high risk licensees should be examined in further detail.

Recommendation 2: The seven Prescribed Substance Licences should be examined.

Recommendation 3: The four licensees for whom device analysis was not carried out should be examined.

Objective 3: ***To identify licensees requiring scrutiny and more stringent oversight with respect to Y2K issues.***

Recommendation 4: Manufacturers, consolidated license holders and gauge users should be contacted regarding their activities.

Recommendation 5: Licensees possessing any of the eleven identified devices and/or device classes should be monitored.

Recommendation 6: The 62 specifically identified licensees should be contacted regarding their responses, and follow-up information required.

Objective 4: ***To develop Y2K risk profiles and a repository of Y2K-related information on the activities and devices licensed by the MRD.***

Recommendation 7: Vendor or other device specific Y2K information should be placed in the device files.

Recommendation 8: Licensee provided Y2K information (test plans, responses to form, etc.) should be placed in the license files.

Recommendation 9: The qualitative risk analysis process used in this project should be extended, in conjunction with collection of additional information from the licensees, to permit a more quantitative risk analysis to be performed.

Objective 5: ***To generate information that may be used in the development of contingency plans for dealing with Y2K-related incidents.***

Recommendation 10: The contingency plans for the 55 licensees and 11 devices identified as being high risk should be reviewed in detail. The contingency plans as a minimum should include the elements discussed in Appendix D.

5.2 Recommendations Arising from Task Completion

Task 1: Familiarise project staff with the licensed activities and devices lying within the scope of this project.

No specific recommendations have arisen from this task.

Task 2: Review the approach that the MRD has taken to address licensee Y2K-readiness.

Recommendation 11: MRD has initiated a detailed and ongoing Y2K risk management program. Several follow-up steps are required to monitor and maintain this program: (a) the missing licensee responses should be obtained and reviewed; (b) the 34 licensees who responded that they had a Y2K risk should be reviewed in detail; (c) all license modifications/revisions should specifically reviewed for Y2K implications.

Recommendation 12: Due to the time limitation, further discussions with licensees should be accelerated in terms of the level of detail requested from the licensee (see also Task 4 below).

Task 3: Perform a preliminary review of the devices and activities and classify them in terms of susceptibility to Y2K-related problems.

No specific recommendations have arisen from this task.

Task 4: Review the documents that the MRD has sent to licensees on Y2K in accordance with the MRD Y2K Action Plan.

Recommendation 13: If further licensees are subject to a first level review, the use of a modified Year 2000 Response Form should be considered.

Task 5: Review and compare the responses of licensees to the Y2K survey form.

No specific recommendations have arisen from this task.

Task 6: Based on the review of task 5, identify any inconsistencies and the licensees, devices or manufacturers that require special attention and follow-up.

and

Task 7: Review devices, licensees or activities requiring closer scrutiny for Y2K compliance or readiness, as the case may be.

Recommendation 14: In light of the inconsistencies in their responses, all medical accelerator and therapy unit licensees who responded that they did not have a Y2K risk should be required to provide detailed supporting information.

6.0 References

1. SAIC Year 2000 Common Approach Procedure Handbook, Version 1.0, SAIC Proprietary Document, 19 March 1998.
2. SAIC Year 2000 Common Approach, Version 1.0, SAIC Proprietary Document, Version 1.0, 3 December 1997.
3. SAIC Year 2000 Risk Mitigation Policy, Revision 2, 29 June, 1998
4. California Year 2000 Embedded Systems Program Guide, California Department of Information Technology, June 1998.
5. The Health Physics and Radiological Data Handbook, Revised Edition, Edited by Bernard Shleien, Scinta Inc., 1992.

Appendix A: Licensed Activity Categories

Category	Nuclear Substances	Probability 1–10	Hazard 1–10	Risk prob.*haz.	Complexity 1–100	Effort risk*complexity	Number Licences	Total Risk
A	TRIUMF	5	10	50	90	4500	0	0
	Nordion	5	10	50	60	3000	0	0
	Research Accelerators	5	9	45	50	2250	0	0
B	Brachytherapy	8	6	48	30	1440	72	3456
	Teletherapy	3	8	24	35	840	32	768
	Industrial Radiography	5	7	35	20	700	114	3990
	Medical Accelerators	2	8	16	40	640	45	720
	Consolidated Licence	6	3	18	35	630	56	1008
	Therapeutic Nuclear Medicine	5	5	25	25	625	166	4150
	Diagnostic Nuclear Medicine	5	4	20	25	500	221	4420
	Manufacturing of sealed sources	5	3	15	25	375	1	15
	Pool Irradiators	1	9	9	40	360	11	99
C	Service,inst.,dismant, device containing r/	4	5	20	15	300	42	840
	Tracer Studies	4	4	16	15	240	11	176
	Laboratory studies	4	3	12	20	240	399	4788
	Repair of component with luminous compo	6	3	18	10	180	3	54
	Human Research Studies	6	3	18	10	180	7	126
	Processing total unsealed source	3	3	9	15	135	25	225
	Device Manufacturing	2	5	10	10	100	13	130
D	Subsurface Tracer Studies	3	2	6	15	90	3	18
	Logging: Sealed Source	4	2	8	10	80	30	240
	Portable Gauges	6	1	6	10	60	548	3288
	Fixed Gauges	3	2	6	10	60	707	4242
	Distribution	3	2	6	10	60	75	450
	Neutron Generators	2	2	4	15	60	0	0
E	Research:Maximum sealed source	2	2	4	10	40	11	44
	Irradiation: self-shielding type	1	7	7	5	35	32	224
	Calibration	3	2	6	5	30	64	384
	Subsurface Zone Location	3	1	3	10	30	3	9
	Radiography Instruction	2	2	4	5	20	7	28
	Neutron Activation	2	2	4	5	20	2	8
	Electronic component Testing	2	1	2	5	10	2	4
	Teaching	1	2	2	5	10	112	224
	Bone Mineral Analysis	1	2	2	5	10	4	8
	Radioluminescence	3	1	3	3	9	19	57
	X-Ray fluorescence analysis	2	1	2	3	6	235	470
	Dew point detection	1	2	2	3	6	79	158
F	Low energy imaging	1	1	1	5	5	5	5
	Electron capture detection	1	1	1	5	5	357	357
	Fuel gauges on board aircraft	1	1	1	3	3	8	8
	Static elimination	2	1	2	1	2	96	192
	Static detection	2	1	2	1	2	11	22
	Smoke detection	2	1	2	1	2	1	2
	Storage	1	2	2	1	2	139	278
	Borehole Tube Tagging	1	1	1	2	2	7	7
	Surge voltage protection	1	1	1	2	2	8	8
	Remote blade inspection	1	1	1	2	2	0	0
	Lightning warning	1	1	1	2	2	0	0
Totals							3793	35710

Appendix B: Summary of Response Data

Table B-1: Raw Response Data

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Y2K Letters – Radioisotopes English						
Kevin Kane	00-07150-98-REV1	Memorial University of	no		Cawthorn,R.H.	B5
Katherine Mitton	01-02172-99	University of Prince Edward	yes	yes	Cawthorn,R.H.	B5
Pauline Jones	02-07154-98-REV1	Dalhousie University	no		Cawthorn,R.H.	B5
Julia Green-Johnson	02-07880-98-REV1	Acadia University			Cawthorn,R.H.	B5
Katherine Ellis	02-08339-99-REV1	Bedford Institute of	no		Cawthorn,R.H.	B5
Patricia Ovenden	03-07177-98-REV5	University of New Brunswick	no		Cawthorn,R.H.	B5
Anne Monteath	05-01459-99	Hospital for Sick Children			Cawthorn,R.H.	B5
Dave Tucker	05-01495-99B	McMaster University Department of Risk Management Services			Cawthorn,R.H.	B5
John Fitz Gerald	05-03326-98-REV2	Environment Canada and	no		Cawthorn,R.H.	B5
Dr. Phil Leung	05-03659-00A (now -00G)	The Toronto Hospital The General Division	no	yes	Cawthorn,R.H.	B1
Dr. Phil Leung	05-03659-00C	The Toronto Hospital The Ontario Cancer Institute/	no	yes	Cawthorn,R.H.	B1
J.A. Rawlinson	05-03659-00D	The Toronto Hospital The Ontario Cancer Institute	no	yes	Cawthorn,R.H.	B2
Dr. Phil Leung	05-03659-00E	The Toronto Hospital The General Division	no	yes	Cawthorn,R.H.	E1
Simmy Lui	05-03659-97E-REV1	The Toronto Hospital General Division	no	yes	Cawthorn,R.H.	E1
Dr. Phil Leung	05-03659-98A	The Toronto Hospital The Ontario Cancer Institute/	no	yes	Cawthorn,R.H.	B5
Geoff Byford	05-06288-98-REV1	University of Guelph			Cawthorn,R.H.	B5
Ian Fraser	05-07130-98A-REV1	University of Waterloo	no		Cawthorn,R.H.	B5
Susan Roberts	05-07139-99-REV1	University of Western Ontario	no		Cawthorn,R.H.	B5
William Puschalowsky	05-07152-99	University of Ottawa	no		Cawthorn,R.H.	B5
Dr. Brian Colman	05-07155-98-REV3	York University			Cawthorn,R.H.	B5
Wiebke Mortensen	05-07156-98-REV3	Queen's University Environmental Health & Safety	no		Cawthorn,R.H.	B5
Keith Nelligan	05-07278-99-REV1	University of Windsor	no		Cawthorn,R.H.	B5
Dr. Allan Castle	05-07419-98-REV2	Brock University	no		Cawthorn,R.H.	B5
Beverly Plato	05-07453-99-REV1	Carleton University 204 Administration Building	no		Cawthorn,R.H.	B5
Mr. R. Chris Williams	05-07889-98B-REV2	Trent University	no		Cawthorn,R.H.	B5
C. D. Beatty	05-11000-98-REV2 (revoked)	Theratronics International Ltd.	no	yes	Cawthorn,R.H.	C7
Lloyd Hillier	05-11001-98A-REV2 (now -00A)	Nordion International Inc.	no	yes	Cawthorn,R.H.	B9

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Lloyd Hillier	05-11001-98C-REV1 (now -00C)	Nordion International Inc.	no	yes	Cawthorn,R.H.	B8
Lloyd Hillier	05-11001-98G-REV1 (now -00G rev 1)	Nordion International Inc.	no	yes	Cawthorn,R.H.	C7
Hack Chung	05-11336-99A	University of Toronto	no	yes	Cawthorn,R.H.	B5
Dr. Martin King	05-12299-99L	Victoria University Hospital Corporation London Heatlh Sciences Centre	no		Cawthorn,R.H.	B5
Dr. Jeffrey Weitz	05-12410-99M	Hamilton Health Sciences Corporation Henderson General Division			Cawthorn,R.H.	B5
Ramzi Jammal	05-12710-99E	The Ottawa Hospital/ L'hopital d'Ottawa	no		Cawthorn,R.H.	B5
Dan Buksak	06-07153-99-REV2	University of Manitoba Environmental Health & Safety Office	no		Cawthorn,R.H.	B5
Ramin Vikili	06-07622-99	University of Winnipeg	no		Cawthorn,R.H.	B5
Debbie Frattinger	07-07114-97-REV5	University of Saskatchewan Occupational Health and Safety			Cawthorn,R.H.	B5
Dr. Wayne Yerhoff	07-07454-98-REV1	University of Regina	no		Cawthorn,R.H.	B5
Carl D. Schumaker	08-06237-99	University of Alberta	no		Cawthorn,R.H.	B5
Patrick Harder	08-07347-99A	University of Calgary Safety Services	no	yes	Cawthorn,R.H.	B5
Raymond F. McHugh	08-07961-98-REV2	University of Lethbridge	no		Cawthorn,R.H.	B5
Don Murray	08-08955-98-REV2	Alberta Research Council	no		Cawthorn,R.H.	B5
Craig Smith	09-04974-97-REV2	University of British Columbia	no		Cawthorn,R.H.	B5
Dr. J.C. Brodovitch	09-07342-97A-REV2	Simon Fraser University	no		Cawthorn,R.H.	B5
Renato Danesin	09-07637-00	University of Victoria	no		Cawthorn,R.H.	B5
Grant J. Gallant	05-08324-99	Revenue Canada Customs & Excise	no	yes	Chamberlain, R.	E1
Lisa Ward	05-08785-00	Shield Source Inc.	no	yes	Chamberlain, R.	B8
Lisa Ward	05-08785-98A-REV2	Shield Source Inc.	no	yes	Chamberlain, R.	C7
Shane MacDougall	05-11341-97-REV2	SRB Technologies (Canada) Inc.	no	yes	Chamberlain, R.	B8
Shane MacDougall	05-11341-98	SRB Technologies (Canada) Inc.	no	yes	Chamberlain, R.	C7
B. Munro	05-03949-98	Western Stress Industries			Cochrane, D.W.	C7
Dr. C. Caldwell	05-01480-98A-REV1	Sunnybrook Health Science Centre	yes/no	yes	Irwin, R.E.	E1
Peter O'Brien	05-12609-98BA-REV1	Cancer Care Ontario Toronto-Sunnybrook Regional Cancer Centre	yes	yes	James, M.F.	B2
Peter O'Brien	05-12609-98BB-REV1	Cancer Care Ontario	yes	yes	James, M.F.	B1
Peter F. O'Brien	05-12609-98BE-REV1	Cancer Care Ontario	?	yes	James, M.F.	B1
Dr. Peter Dunscombe	05-12609-98BI-REV1	Cancer Care Ontario	no	no	James, M.F.	B2
Dr. Douglas Wyman	05-12609-99A	Cancer Care Ontario	yes	yes	James, M.F.	B2
Dr. G.P. Raaphorst	05-12609-99AA	Cancer Care Ontario	no	no	James, M.F.	B2

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Dr. G.P. Raaphorst	05-12609-99AB	Cancer Care Ontario	no	no	James, M.F.	B2
Dr. G.P. Raaphorst	05-12609-99AD	Cancer Care Ontario			James, M.F.	B1
Dr. G.P. Raaphorst	05-12609-99AG	Cancer Care Ontario	yes	yes	James, M.F.	B1
Dr. P.L. McGhee	05-12609-99AK	Cancer Care Ontario Northwestern Ontario Regional	yes	yes	James, M.F.	B2
Dr. P.L. McGhee	05-12609-99AM	Cancer Care Ontario Northwestern Ontario Regional	yes	yes	James, M.F.	B1
Dr. Ethan Laukkanen	05-12609-99AS	Cancer Care Ontario	no	no	James, M.F.	B2
V.K. Prasanna Kumar	05-12609-99AU-REV1	Cancer Care Ontario	yes	yes	James, M.F.	B1
Dr. Ethan Laukkanen	05-12609-99AW	Cancer Care Ontario	yes	yes	James, M.F.	B1
Dr. P. Dunscombe	05-12609-99BL	Cancer Care Ontario	no	no	James, M.F.	B1
Dr. Douglas Wyman	05-12609-99C	Cancer Care Ontario	yes	yes	James, M.F.	B1
Dr. D.J. Dawson	05-12609-99Q	Cancer Care Ontario	no	no	James, M.F.	B2
Dr. D.J. Dawson	05-12609-99S-REV1	Cancer Care Ontario			James, M.F.	B1
Dr. D.J. Dawson	05-12609-99V-REV1	Cancer Care Ontario			James, M.F.	B1
Dr. D. Viggars	06-01709-97-REV1	Manitoba Cancer Treatment and Research Foundation	no	no	James, M.F.	B2
Dr. D. Viggars	06-01709-98C-REV2	Manitoba Cancer Treatment and Research Foundation	no	no	James, M.F.	B1
Patrick Cadman	07-01766-99	Saskatoon Cancer Centre	no	no	James, M.F.	B2
Patrick Cadman	07-01766-99F	Saskatoon Cancer Centre	yes/no	yes	James, M.F.	B1
Greg M. Kennelly	09-06074-98-REV3	British Columbia Cancer Agency	no	yes	James, M.F.	B2
Greg M. Kennelly	09-06074-98C-REV2	British Columbia Cancer Agency	no	yes	James, M.F.	B1
Greg M. Kennelly	09-06704-98G-REV1	B.C. Cancer Agency Fraser Valley Cancer Centre	no	yes	James, M.F.	B1
Ross Pelley	00-01002-98-REV1	Corner Brook Pulp & Paper Limited	no	no	Lavoie, G.	D4
William Spurrel	00-10924-98A-REV3	North Atlantic Refining Limited	no	no	Lavoie, G.	D4
Michael Wilson	00-11708-99-REV3	Abitibi-Consolidated Inc.	no	yes	Lavoie, G.	D4
Robert Pitcher	00-11709-99-REV1	Abitibi-Consolidated Inc.	yes	yes	Lavoie, G.	D4
William A. Fraser	02-02787-99	Scott Maritimes Limited	no	yes	Lavoie, G.	D4
Bob Campbell	02-04090-99-REV2	Stora Forest Industries Limited	no	no	Lavoie, G.	D4
Haylett Clarke	02-04502-99A	Michelin North America (Canada) Inc.	no	no	Lavoie, G.	D4
Erin Graham	02-05294-98A-REV1	Cape Breton Development Corporation	no	no	Lavoie, G.	D4
J. Gormely	02-08948-98-REV1	Avon Valley Greenhouses Ltd.	no	no	Lavoie, G.	D4
Archie Collins	02-11612-98-REV1	Trenton Generating Station	no	no	Lavoie, G.	D4
Allan Young	03-01043-98-REV3	Irving Pulp & Paper Limited	no	yes	Lavoie, G.	D4
John Marmen	03-02458-99-REV2	Fraser Paper Inc. (Canada)	no	no	Lavoie, G.	D4
R. Kaine	03-03896-98-REV1	St. Anne Nackawic Pulp Company Limited	no	no	Lavoie, G.	D4
Frank MacLaughlin	03-04118-99B-REV1	Repap New Brunswick Inc.	no	no	Lavoie, G.	D4
Murray C. Hoyt	03-04365-99-REV1	Lake Utopia Paper Division of J.D. Irving Ltd.	no	no	Lavoie, G.	D4

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Daniel Bourgoin	03-04709-99	Avenor Maritimes Inc.	no	no	Lavoie, G.	D4
Volker Bochmann	03-05598-00	Flakeboard Company Limited	no	no	Lavoie, G.	D4
Alexander Coles	03-05959-99A	Irving Oil Limited Refining Division	no	no	Lavoie, G.	D4
Rick Mean	03-08261-00	Stone Container (Canada) Inc.	no	no	Lavoie, G.	D4
Wendell MacArthur	03-11809-99	Irving Paper Inc.	no	no	Lavoie, G.	D4
Claude Lagace	03-12046-99	Brunswick Mining & Smelting Corp. Ltd.			Lavoie, G.	D4
Rod Eagles	03-12233-98-REV2	New Brunswick Power Corporation	no	no	Lavoie, G.	D4
David W. Melanson	03-12237-98-REV3	New Brunswick Power Corporation	no	no	Lavoie, G.	D4
Raymond Soucy	03-12240-98-REV2	New Brunswick Power Corporation	no	no	Lavoie, G.	D4
Joan Burke	03-12610-99	PCI Chemicals Canada Inc.	no	no	Lavoie, G.	D4
Andre Boisvert	04-03983-98	Stone Container (Canada) Inc.			Lavoie, G.	D4
Pierre Sipling	04-11405-99C	Sorevco Societe en commandite	no	no	Lavoie, G.	B8
B.J. Brenko	04-12379-98-REV2	Donohue QUNO Inc.	no	no	Lavoie, G.	D4
L. Roberge	05-01258-98-REV2	MacMillan Bloedel Limited Sturgeon Falls Division	no	no	Lavoie, G.	D4
D. Ondrejech	05-01284-98A-REV1	Petro Canada Lubricants	no	no	Lavoie, G.	D4
Brian McCracken	05-01335-98-REV2	Du Pont Canada Inc.	no	no	Lavoie, G.	D4
Patrick Fantin	05-01342-00A	Falconbridge Limited	no	no	Lavoie, G.	D4
Rob Gowan	05-01348-99	Noranda Mining and Exploration Inc.			Lavoie, G.	D4
C.J. Collins	05-01361-98A-REV1	Domtar Inc. Div. of Domtar Specialty Fine Paper Group	no	no	Lavoie, G.	D4
R.L. Roach	05-01371-97E-REV2	Inco Limited	no	yes	Lavoie, G.	B8
R.L. Roach	05-01371-98H-REV1	Inco Limited	no	no	Lavoie, G.	D4
Don Peters	05-01385-98-REV3	E.B. Eddy Forest Products Ltd.	no	no	Lavoie, G.	D4
David McPherson	05-01398-99	3M Canada Company-Compagnie 3M Canada	no	no	Lavoie, G.	D4
David Mcpherson	05-01398-99A-REV1	3M Canada Inc.			Lavoie, G.	D4
David Mcpherson	05-01398-99B	3M Canada Inc.			Lavoie, G.	D4
Bill Sparks	05-01412-99A-REV2	Bayer Rubber Inc.	no	no	Lavoie, G.	D4
A. Gereghty	05-01437-98-REV1	Spruce Falls Inc.	no	no	Lavoie, G.	D4
J.S. Beattie	05-01438-98A-REV1	Stelco Steel			Lavoie, G.	D4
H. Giethoorn	05-01996-98-REV2	Sunoco Inc.	no	no	Lavoie, G.	D4
T.B. Wesolowski	05-02190-99	Co-Steel Lasco	no	no	Lavoie, G.	D4
A. Briand	05-02410-98-REV2	Malette Kraft Pulp & Power Div. of Malette Inc.			Lavoie, G.	D4
T. Fontana	05-02816-98B-REV3	Falconbridge Limited	no	no	Lavoie, G.	D4
Linda Byron	05-02816-98G-REV2	Falconbridge Limited	no	no	Lavoie, G.	D4
Audithy Knox	05-03092-98-REV1	Celanese Canada Inc.	no	no	Lavoie, G.	D4
R. Kennedy	05-05084-98-REV1	Mattabi Mines Limited	no	no	Lavoie, G.	D4

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Larry Stacey	05-05612-00	IKO Industries Ltd.			Lavoie, G.	D4
Cecilia Lugtu	05-06010-00	Valmet Automation (Canada) ltd.	no	yes	Lavoie, G.	B8
Cecilia Lugtu	05-06010-98-REV6	Valmet Automation (Canada) Ltd.	no	no	Lavoie, G.	C7
Tom Rogers	05-06293-99	Nova Chemicals Ltd.	no	no	Lavoie, G.	D4
Tim Yang	05-06327-99	Domtar Packaging a Division of Domtar Inc.	no	no	Lavoie, G.	D4
Momo Markovich	05-06348-99	NOVA Chemicals (Canada) Ltd.	no	no	Lavoie, G.	D4
M. Murji	05-06408-98-REV3	Ronan Engineering Limited	no	yes	Lavoie, G.	C7
Roger Deschenes	05-07104-99	Morbern Inc.	no	no	Lavoie, G.	D4
F. Galicia	05-07162-99	ADM Agri-Industries Ltd.	no	no	Lavoie, G.	D4
John Colville	05-07662-99-REV1	CanRoof Corporation Inc.			Lavoie, G.	D4
Dave Walker	05-07930-99C	Uniroyal Chemical Ltd.	no	no	Lavoie, G.	D4
Luke Walker	05-08081-98-REV4	Imperial Oil	no	no	Lavoie, G.	D4
D.A. Wright	05-08824-98-REV1	BeachviLime Limited	no	no	Lavoie, G.	D4
Gerald Goodkey	05-09242-99	Williams Operating Corporation	no	no	Lavoie, G.	D4
Ray McCarthy	05-10344-98-REV6	Omya Canada Inc.	no	no	Lavoie, G.	D4
Lucas Van Veen	05-10347-98B	Laidlaw Environmental Services			Lavoie, G.	D4
P. Klimtschuck	05-10745-97-REV3	Barrick Gold Corporation	no	no	Lavoie, G.	D4
K.S. Shin	05-10895-99-REV1	Stern Laboratories Inc.	no	no	Lavoie, G.	D4
Ed Boldt	05-11105-99	Renfrew Tape Limited	no	no	Lavoie, G.	D4
Malcolm Thomas	05-11374-99	VFT Inc.	no	no	Lavoie, G.	D4
Gilbert Boyer	05-11703-99-REV2	Kimberly-Clark Forest Products Inc.	no	no	Lavoie, G.	D4
Charlene Lepage-Barron	05-11710-99-REV1	Abitibi-Price Inc.	yes	yes	Lavoie, G.	D4
Ean Hays	05-11714-99-REV1	Abitibi-Consolidated Inc.			Lavoie, G.	D4
Thomas J. Croskery	05-11732-99A	Terra International (Canada)	no	no	Lavoie, G.	D4
M. Bednarz	05-11869-98-REV3	Placer Dome Canada Limited	no	no	Lavoie, G.	D4
B.M. Strenzke	05-11872-98-REV1	Henkel Canada Ltd.	no	no	Lavoie, G.	D4
G. Stoudt	05-11889-98A-REV2	Nova Chemicals Ltd.	no	no	Lavoie, G.	D4
Douglas D. Raoul	05-12008-98-REV3	Abitibi-Consolidated Inc.	no	yes	Lavoie, G.	D4
Mark O'Brien	05-12029-99A	Avenor Inc. (changed to Weyerhauser, 05-12784-00D)	no	no	Lavoie, G.	D4
William P. Ivey	05-12056-99	Chapleau Co-Generation Limited	no	no	Lavoie, G.	D4
John Tjioe	05-12058-99	Biltrite Rubber (1984) Inc.	no	no	Lavoie, G.	D4
Tony DeAmorim	05-12117-99	G-P Flakeboard	no	no	Lavoie, G.	D4
John Landriault	05-12120-99	Kinross Gold Corporation	no	yes	Lavoie, G.	D4
David J.K. Mitchell	05-12316-98-REV1	Macmillan Bloedel Pembroke Limited Partnership	no	no	Lavoie, G.	D4
Marcel Perreault	05-12396-98-REV1	ETI Canada Inc.	no	no	Lavoie, G.	D4

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
David Hull	05-12486-99	941037 Ontario Ltd. (Enviro Fuel)	no	no	Lavoie, G.	D4
James Robillard	05-12585-99	Lake Erie Steel Company Ltd.	no	no	Lavoie, G.	D4
John Yandt	06-01701-97D-REV1	Inco Limited			Lavoie, G.	D4
C.R. Dudley	06-05795-98-REV2	Simplot Canada Limited	no	no	Lavoie, G.	D4
G. Steski	06-11573-98-REV1	CanAmera Foods	no	no	Lavoie, G.	D4
N. Hines	06-12143-99-REV1	Gerdau MRM Steel Inc.			Lavoie, G.	D4
Mike Kizuik	06-12338-00	Tolko Manitoba Inc.	no	no	Lavoie, G.	D4
M.A. Wright	07-01753-99	International Minerals & Chemical (Canada) Global Limited			Lavoie, G.	D4
Steve Irving	07-02651-99	Westspur Pipe Line Company Inc.	no	no	Lavoie, G.	D4
Lane Knorr	07-02954-97-REV1	Potash Corporation of Saskatchewan Inc. Lanigan Division	no	no	Lavoie, G.	D4
C. Terry	07-06732-98C-REV2	Consumers' Co-Operative Refineries Ltd.	no	no	Lavoie, G.	D4
C. Wist	07-11500-97-REV1	Husky Oil Operations Limited	no	no	Lavoie, G.	D4
Robert J. Harkness	07-11523-98-REV2	Saskferco Products Inc.			Lavoie, G.	D4
R. Cochrane	07-12181-97-REV1	Weyerhaeuser Saskatchewan Ltd. Prince Albert Pulp & Paper Division			Lavoie, G.	D4
G. Swejda	07-12186-97-REV1	Potash Corporation of Saskatchewan Inc.	no	no	Lavoie, G.	D4
E. G. Zimmer	07-12194-97-REV1	Potash Corporation of Saskatchewan Inc.	no	no	Lavoie, G.	D4
G. Kary	07-12195-97-REV1	Potash Corporation of Saskatchewan Inc.			Lavoie, G.	D4
Mr. Robert Boardman	07-12271-98-REV3	Cargill Limited	no	no	Lavoie, G.	D4
Roy Hardy	07-12443-99	IMC Central Canada Potash Inc.	no	no	Lavoie, G.	D4
D. Fornstone	08-01797-98A-REV2	Petro-Canada Products Company	no	no	Lavoie, G.	D4
James Coles	08-01802-99	Agrium Inc.	no	yes	Lavoie, G.	D4
Graham Hutchison	08-01809-98B-REV2	Imperial Oil	no	no	Lavoie, G.	D4
B. Robertson	08-01817-98-REV2	Weldwood of Canada Limited			Lavoie, G.	D4
Roger Stacy	08-01824-98A-REV3	Viridian Inc. doing business under the name Agrium	no	yes	Lavoie, G.	D4
Tim Gondek	08-02227-00C	Suncor Energy Inc.			Lavoie, G.	D4
J. Dhatt	08-02501-99	EMCO Limited	no	no	Lavoie, G.	D4
K.F. Bills	08-02541-99-REV2	Peace Pipe Line Ltd.	no	no	Lavoie, G.	D4
Mr. Dave Marsh	08-02962-97-REV1	TransAlta Utilities Corporation			Lavoie, G.	D4
D. Keenan	08-03291-98F-REV1	Dow Chemical Canada Inc.	no	no	Lavoie, G.	D4
James Manning	08-04769-99	Smoky River Coal Ltd.			Lavoie, G.	D4
Hugh Shawcross	08-06115-99-REV1	Canadian Fertilizers Limited	no	no	Lavoie, G.	D4
J. Radomsky	08-06379-98A-REV1	Celanese Canada Ltd.	no	no	Lavoie, G.	D4
William O. Taylor	08-06671-98-REV3	Syncrude Canada Ltd.	no	no	Lavoie, G.	D4
M.E. Hogarth	08-08180-97-REV2	Shell Canada Products Limited	no	yes	Lavoie, G.	D4

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J.F. Beal	08-08302-98-REV1	Canbra Foods Ltd.	no	no	Lavoie, G.	D4
Brent West	08-08489-99-REV2	AT Plastics Inc.	no	no	Lavoie, G.	D4
Gordon Taylor	08-08603-99-REV1	NOVA Chemicals Ltd.	no	no	Lavoie, G.	D4
J. Freeman	08-08722-97-REV2	Obed Mountain Coal Ltd.	no	no	Lavoie, G.	D4
Robert Rivard	08-09984-98A-REV2	Shell Canada Ltd.	no	no	Lavoie, G.	D4
Dan Ish	08-10650-99	Echo Bay Mines Ltd.	no	no	Lavoie, G.	D4
M. Steeves	08-10686-99-REV1	Millar Western Pulp (Whitecourt) Ltd.	no	no	Lavoie, G.	D4
Jack Symes	08-11035-98-REV2	Imperial Oil Limited	no	no	Lavoie, G.	D4
Larry Logan	08-11242-97-REV1	Slave Lake Pulp Corporation	no	yes	Lavoie, G.	D4
Jan Luppens	08-11252-98-REV5	Alberta Newsprint Company	no	no	Lavoie, G.	D4
David Settle	08-11427-99-REV2	Millar Western Pulp (Meadow Lake) Ltd.	no	no	Lavoie, G.	D4
G. Bott	08-11428-99	Albchem Industries Ltd.	no	no	Lavoie, G.	D4
Q. Jones	08-11444-99	Alberta Envirofuels Inc.	no	no	Lavoie, G.	D4
T. Coomber	08-11653-98-REV1	Weyerhaeuser Canada Limited	no	yes	Lavoie, G.	D4
Frank Dirksen	08-11660-98-REV2	Daishowa-Marubeni International Limited	no	no	Lavoie, G.	D4
P. Worden	08-11696-99-REV1	Altasteel Ltd.	no	no	Lavoie, G.	D4
D. Homick	08-12006-98-REV1	The Cobalt Refinery Company Inc.			Lavoie, G.	D4
Dennis Wong	08-12093-99	Inland Cement Limited	no	no	Lavoie, G.	D4
E. Karst	08-12193-97-REV1	Eagle River Power Services Inc.	no	no	Lavoie, G.	D4
Michael Moore	08-12217-98-REV1	Edmonton Power Inc.	no	no	Lavoie, G.	D4
Dan Sliwkanich	08-12368-99	Aqualta Inc.			Lavoie, G.	D4
Jim Tennant	08-12547-99	Nevis Ltd.	no	no	Lavoie, G.	D4
Dave Daigle	08-12641-99	Ranger Board Limited	no	no	Lavoie, G.	D4
Mr. P. Kaupas	08-12676-00	Orica Canada Inc.	no	no	Lavoie, G.	D4
Glenn Brown	08-12697-00	Shell Canada Products Ltd.			Lavoie, G.	D4
Phil Femmler	08-12718-00	Pengrowth Corporation	no	yes	Lavoie, G.	D4
R. Wing	09-01878-98A-REV3	Howe Sound Pulp and Paper Ltd. Howe Sound Pulp Division	no	no	Lavoie, G.	D4
T. Toth	09-01881-98-REV2	Skeena Cellulose Inc.	no	no	Lavoie, G.	D4
F.G. Heslop	09-01882-99A	Cominco Limited	no	no	Lavoie, G.	D4
Tim Worthen	09-01900-98-REV4	MacMillan Bloedel Research			Lavoie, G.	D4
M.A. Johnson	09-01988-98	Fletcher Challenge Canada Ltd.	no	yes	Lavoie, G.	D4
M.A. Johnson	09-01988-98-REV1	Fletcher Challenge Canada Ltd.			Lavoie, G.	D4
A. Cheveldave	09-02341-98-REV4	Celgar Pulp Company	no	no	Lavoie, G.	D4
Larry McKay	09-02556-99	Northwood Pulp & Timber Limited			Lavoie, G.	D4
Garth Cuthbert	09-02699-98B-REV1	B.C. Hydro and Power Authority	no	no	Lavoie, G.	D4

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R. Robinson	09-02809-97-REV5	Bowater Pulp and Paper Canada Inc. Gold River Operations			Lavoie, G.	D4
Leonard R. Timmins	09-02994-99-REV1	Canadian Forest Products Ltd. Prince George Pulp and Paper Mills Division			Lavoie, G.	D4
E. McIvor	09-03467-00	Crestbrook Forest Industries Ltd	no	no	Lavoie, G.	D4
Carl Reimer	09-03743-98-REV3	Westcoast Energy Inc.	no	no	Lavoie, G.	D4
C. Howe	09-03838-98-REV3	Eurocan Pulp & Paper Co.	no	yes	Lavoie, G.	D4
K. Muller	09-04730-99A	Fording Coal Limited			Lavoie, G.	D4
Bill Lucin	09-04784-97-REV4	Fletcher Challenge Canada Ltd.	no	no	Lavoie, G.	D4
C.J. Petersen	09-04801-97-REV1	Cariboo Pulp & Paper Company	no	no	Lavoie, G.	D4
John Beaumont	09-04854-99	Highland Valley Copper	no	yes	Lavoie, G.	D4
Dave Smith	09-05050-98-REV2	Weyerhaeuser Canada Ltd.	no	yes	Lavoie, G.	D4
Wayne Cole	09-05509-99	Westmin Resources Limited	no	no	Lavoie, G.	D4
L.A. Keiver	09-06445-99-REV1	Western Pulp Limited Partnership	no	no	Lavoie, G.	D4
L. Norgren	09-06896-98-REV1	Tilbury Cement Limited			Lavoie, G.	D4
John Bartnik	09-08075-99	Chemical Lime Company of Canada Inc.	no	no	Lavoie, G.	D4
L. Barnes	09-08094-98-REV1	Western Pulp Limited Partnership Squamish Operations			Lavoie, G.	D4
Ken Ingram	09-08298-00	West Coast Reduction Ltd.			Lavoie, G.	D4
D. Tennick	09-08580-99B	Bullmoose Operating Corporation	no	no	Lavoie, G.	D4
David Mchaina	09-10976-00A	Boliden Westmin Limited			Lavoie, G.	D4
Rik Skelton	09-11344-98-REV1	Louisiana-Pacific Canada Ltd.	no	no	Lavoie, G.	D4
E. Grant	09-11356-98A-REV1	Rogers Sugar Ltd.			Lavoie, G.	D4
Dave Western	09-11370-00	B.C. Chemicals Ltd.	no	no	Lavoie, G.	D4
Gary Dunnet	09-11475-99-REV1	Manalta Coal Ltd.			Lavoie, G.	D4
Paul Melanson	09-11554-98-REV1	NW Energy (Williams Lake) Corp.	no	no	Lavoie, G.	D4
B. Black	09-11584-00A	Quintette Operating Corporation	no	no	Lavoie, G.	D4
Bob Dalflyen	09-11718-99C	Elkview Coal Corporation	?	yes	Lavoie, G.	D4
W.J. Thomson	09-11738-99	Fording Coal Limited	no	no	Lavoie, G.	D4
J.P. Mikkelsen	09-11888-98-REV1	Finlay Forest Industries Inc.	no	no	Lavoie, G.	D4
Dennis Letasy	09-12043-99-REV2	Fording Coal Ltd. Coal Mountain Operations	no	no	Lavoie, G.	D4
R. Chahley	09-12070-99	Harmac Pacific Inc.	no	no	Lavoie, G.	D4
D. Selent	09-12198-97-REV2	Quinsam Coal Corporation	no	yes	Lavoie, G.	D4
W.J. Cheetham	09-12447-99A-REV4	Pacifica Papers Inc.	no	no	Lavoie, G.	D4
Don Marocchi	09-12448-99-REV1	Pacifica Papers Inc. Alberni Specialties Division	no	no	Lavoie, G.	D4
Joseph Hettinger	09-12452-99A	Huckleberry Mines Ltd.			Lavoie, G.	D4
Randy Drobot	09-12509-99	Mount Polley Mining Corporation	no	no	Lavoie, G.	D4

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Brian Robertson	09-12586-99-REV1	Kemess Mines Inc.	no	no	Lavoie, G.	D4
Steve Holmes	09-12623-99	Thompson Creek Mining Ltd.	no	no	Lavoie, G.	D4
George Rolfe	09-12632-99	Slocan Forest Products Ltd.	no	no	Lavoie, G.	D4
John Knapp	10-07784-99	Cominco Ltd.	no	no	Lavoie, G.	D4
Jeremy Bell	11-12267-00	Anvil Range Mining Corporation	no	no	Lavoie, G.	D4
C. Gallant	01-02812-98D-REV1	Agriculture and Agri-Food Canada Research Station			Licea, J.A.	D4
Joseph C. McCulley	03-02107-98A-REV1	New Brunswick Power Corporation	no	yes	Licea, J.A.	B5
Philip S. Wilson	03-06469-98-REV2	N.B. Power Corporation Point Lepreau Generating Station	no	yes	Licea, J.A.	B5
Marcel Hascal	05-01362-99A-REV3	Ontario Hydro	yes	yes	Licea, J.A.	B5
W.P. Dyer	05-02206-98-REV1	Johnson & Johnson Medical Products A Division of Johnson & Johnson Inc.			Licea, J.A.	B9
D.W. Pearse	05-08098-97-REV1	Isomedix Corporation	no	yes	Licea, J.A.	B9
Michael Kisly	05-12470-99	Ontario Hydro Technology Services and New Pro. Dev.	no	yes	Licea, J.A.	B5
Dr. Larry McNelles	05-03608-99	Scintrex Limited			Maclean, C.M.	C7
Joanne Meyer	05-09943-00	PE Photovac a div. of Perkin-Elmer (Canada) Limited	no	yes	Maclean, C.M.	E1
Peter Rostant	05-10813-00	IDS Intelligent Detection Systems Inc. CPAD Technologies Div. Of IDS Inc.			Maclean, C.M.	C7
Dr. L.L. Danylewych-May	05-11013-98B-REV1	Barringer Research Ltd.	no	yes	Maclean, C.M.	C7
John Traczyk	05-12562-00	North American Detectors Inc.			Maclean, C.M.	C7
Sherrie Gabert	05-07264-98-REV1	Pylon Electronics Inc.	no	yes	Maxwell, R.	C7
Karin Gordon	06-08218-97D-REV5	Health Sciences Centre	no	no	Maxwell, R.	B5
Greg M. Kennelly	09-06074-98E-REV1	British Columbia Cancer Agency	no	yes	Maxwell, R.	E1
Dr. R.E. Williams	05-03694-97-REV1	National Research Council Canada Inst. for Biological Sciences	no	yes	Poirier, J.C.	B5
Bram Ramjiwan	06-11847-98-REV1	National Research Council Canada	no	no	Poirier, J.C.	B5
Tibor Vozner	05-12202-97-REV4	S & G Technologies Inc			Smyth, M.P.	B8
Peter Lawrence	05-12543-99-REV2	AlliedSignal Aerospace Canada			Smyth, M.P.	B8
Abdel Salam Mesbah	00-09523-99A	Nfld Cancer Treatment & Research			Yu, C.W.	B2
Abdel Salam Mesbah	00-09523-99B	Nfld Cancer Treatment & Research			Yu, C.W.	B1
Dr. W.T. Hooper	01-01010-99B-REV1	Queen Elizabeth Hospital			Yu, C.W.	B2
Dr. John Andrew	02-12278-98P-REV1	Queen Elizabeth II Health Science Centre Department of Safety and Fire Prevention	no	yes	Yu, C.W.	B1
Dr. John Andrew	02-12278-98R-REV1	Queen Elizabeth II Health Science Centre Department of Safety and Fire Prevention	no	yes	Yu, C.W.	B2
Dr. John Andrew	02-12278-98T-REV1	Queen Elizabeth II Health Science Centre Department of Safety and Fire Prevention	yes	yes	Yu, C.W.	B1

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N.S. Kulkarni	03-01045-99B-REV1	Saint John Regional Hospital	no	no	Yu, C.W.	B2
N.S. Kulkarni	03-01045-99C	Saint John Regional Hospital	no	no	Yu, C.W.	B1
Jean Robins	05-01466-99 (revoked)	The Ontario Cancer Treatment & Research Foundation	no	no	Yu, C.W.	B2
Jean Robins	05-01466-99D	The Ontario Cancer Treatment and Research Foundation	yes	yes	Yu, C.W.	B1
G.G. Byford	05-06288-98C-REV1	University of Guelph			Yu, C.W.	B2
M.G. Schmid	07-01764-97A-REV2	Allan Blair Cancer Centre	yes	yes	Yu, C.W.	B2
M.G. Schmid	07-01764-97C-REV4	Allan Blair Cancer Centre	yes	yes	Yu, C.W.	B1
Dr. G. Sandison	08-01831-99	Alberta Cancer Board	no	yes	Yu, C.W.	B1
Dr. G. Sandison	08-01831-99B	Alberta Cancer Board			Yu, C.W.	B2
Dr. G. Sandison	08-01831-99C	Alberta Cancer Board	no	yes	Yu, C.W.	B1
C.S. Davey	08-01832-97-REV1	Alberta Cancer Board			Yu, C.W.	B2
C.S. Davey	08-01832-97C-REV3	Alberta Cancer Board			Yu, C.W.	B1
B.E. Meeker	08-01832-97J-REV1	Alberta Cancer Board	no		Yu, C.W.	E1
C. Davey	08-01832-97O-REV1	Alberta Cancer Board			Yu, C.W.	B1
Dr. J.M. Scrimger	09-04976-98	British Columbia Cancer Agency	yes/no	yes	Yu, C.W.	B1
Dr. J.W. Scrimger	09-04976-98B	British Columbia Cancer Agency	no	no	Yu, C.W.	B2
Dr. M. Al-Ghazi	09-12080-98A-REV1	B.C. Cancer Agency Fraser Valley Cancer Centre	no	no	Yu, C.W.	B2
Dr. M. Al-Ghazi	09-12080-99	B.C. Cancer Agency Fraser Valley Cancer Centre	no	no	Yu, C.W.	B1
Dr. M. Al-Ghazi	09-12080-99A-REV1	B.C. Cancer Agency Fraser Valley Cancer Center	no	no	Yu, C.W.	B1
Y2K Letters - Radioisotopes French						
Daniel Letourneau	04-01179-97-REV4	Complexe hospitalier de la Sagamie	yes	yes	Irwin, R.E.	B1
Normand Freniere	04-01186-97A-REV2	Hopital Maisonneuve-Rosemont	yes	yes	Irwin, R.E.	B1
Normand Freniere	04-01186-98E-REV3	Hopital Maisonneuve-Rosemont	no	yes	Irwin, R.E.	B2
Dr. Renald Lemieux	04-12180-98D-REV2	Centre universitaire de sante de l'Estrie			Irwin, R.E.	B2
Luc Ouellet	04-12180-98E	Centre universitaire de sante de l'Estrie			Irwin, R.E.	B1
Jean Pouliot	04-12258-98Y-REV2	CHUQ Pavillon l'Hotel-Dieu de Quebec	no	yes	Irwin, R.E.	B1
Jean Pouliot	04-12258-98Z-REV1	Centre hospitalier universitaire de Quebec	no	yes	Irwin, R.E.	B1
Jean Pouliot	04-12258-99U-REV2	CHUQ Pavillon de l'Hotel-Dieu de Quebec	no	yes	Irwin, R.E.	B2
Alain Gauvin	04-12527-99AM-REV1	Centre hospitalier de l'universite de Montreal	no	no	Irwin, R.E.	B2
Real Besner	04-12527-99H-REV1	Centre hospitalier de l'universite de Montreal	no	no	Irwin, R.E.	B2
Real Besner	04-12527-99I	Centre Hospitalier de l'Universite de Montreal	no	no	Irwin, R.E.	B2
J. Brodeur	04-01070-98-REV1	Avenor Inc.	no	no	Lavoie, G.	D4
Alain Bertrand	04-01076-98-REV2	Petro-Canada Ltee	no	no	Lavoie, G.	D4
R. Tellier	04-01085-98-REV5	Abitibi-Consolidated Inc.			Lavoie, G.	D4
Ghislain Boivin	04-01086-98-REV2	Abitibi-Consolidated Inc.	no	yes	Lavoie, G.	D4

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Levis Boudreault	04-01139-98-REV2	Cascades Inc.	no	no	Lavoie, G.	D4
Jacques Girard	04-02142-99-REV1	Corporation Stone-Consolidated/ Stone-Consolidated Corporation	no	yes	Lavoie, G.	D4
Pierre Lacoursiere	04-02209-99-REV1	Corporation Stone-Consolidated			Lavoie, G.	D4
Francois Lamarche	04-02279-99	Emballages Stone (Canada) Inc./			Lavoie, G.	D4
Jean Bourque	04-02617-99B-REV1	Donohue Inc.	no	no	Lavoie, G.	D4
Lucien St-Pierre	04-03080-98-REV1	Kruger Inc.	no	yes	Lavoie, G.	D4
Mario Chouinard	04-03123-99	Mineraux Noranda Inc.	no	yes	Lavoie, G.	D4
Eros Campagnoli	04-03509-99A	Lafarge Canada Inc.			Lavoie, G.	D4
Gaston Arsenault	04-04234-99-REV2	Zinc Electrolytique du Canada	no	no	Lavoie, G.	D4
Gilles Isabelle	04-04983-99A-REV1	Ispat Sidbec Inc.	no	no	Lavoie, G.	D4
Jayant Kandy	04-05468-98-REV2	Emco Limitee	no	yes	Lavoie, G.	D4
Yvon L'Archeveque	04-05940-98A-REV1	Kruger Inc.	no	yes	Lavoie, G.	D4
Jean-Luc Gaudreau	04-06123-99-REV1	F.F. Soucy Inc.	no	no	Lavoie, G.	D4
Lucien Carrier	04-06195-99	SKW Canada Inc.	no	no	Lavoie, G.	D4
Remi Vachon	04-06298-99-REV1	Tembec Inc.			Lavoie, G.	D4
Jerome Nzakimuena	04-06382-98-REV1	Les Metaux Billiton Inc.	no	no	Lavoie, G.	D4
S. Roberge	04-06821-98-REV1	Graybec Calc Inc.	no	no	Lavoie, G.	D4
Serge Lefebvre	04-06949-98	Donohue St-Felicien Inc.	no	no	Lavoie, G.	D4
Alain Bolduc	04-07715-00	La Compagnie Miniere Quebec	no	no	Lavoie, G.	D4
Charles Simard	04-08068-97-REV3	Produits Forestiers Donohue Inc.	no	no	Lavoie, G.	D4
Claude Audet	04-08705-97-REV2	Montell Canada Inc.			Lavoie, G.	D4
Jacques Talbot	04-08826-98-REV2	Cambior Inc.	?	yes	Lavoie, G.	D4
Y. Lachance	04-09058-98A	Daishowa Inc.	no	no	Lavoie, G.	D4
Carol Beauchesne	04-10556-99	Chemprox Chimie Inc.	no	no	Lavoie, G.	D4
R. Lepine	04-10970-98-REV2	Novacor Chimie (Canada) Ltee	no	no	Lavoie, G.	D4
Michel Desrosiers	04-11226-97-REV1	Donohue Matane Inc.	no	no	Lavoie, G.	D4
Remi Vachon	04-11449-99	Temboard Inc.			Lavoie, G.	D4
Gabriel Ouellet	04-11522-98-REV2	Desencrage C.M.D. Inc.			Lavoie, G.	D4
Daniel Charette	04-11586-98-REV2	Malette Quebec Inc.	no	no	Lavoie, G.	D4
Jocelyn Lessard	04-11711-99-REV1	Abitibi-Consolidated Inc.	no	yes	Lavoie, G.	D4
Remi Vachon	04-11717-99-REV1	Temcell Inc.			Lavoie, G.	D4
Daniel Dulac	04-11723-99	173509 Canada Inc.	no	yes	Lavoie, G.	D4
Sara Desrochers	04-11739-99	Graybec Calc Inc.			Lavoie, G.	D4
P. Trepanier	04-11912-98-REV2	Petresa Canada Inc.	no	no	Lavoie, G.	D4

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Marcel Paquet	04-11934-98-REV1	Produits Forestiers Alliance Inc.	no	no	Lavoie, G.	D4
Martin Fournier	04-11935-98-REV3	Produits Forestiers Alliance Inc	no	no	Lavoie, G.	D4
Jacques Morin	04-11967-98-REV1	Cartons St-Laurent Inc.	no	no	Lavoie, G.	D4
Sylvie Moisan	04-11969-97-REV1	Uniforet-Pate Port-Cartier Inc.	no	no	Lavoie, G.	D4
Bruno Martel	04-12001-98	Cartons St-Laurent Inc./ St. Laurent Paperboard Inc.	no	no	Lavoie, G.	D4
Andre Nault	04-12040-99-REV2	Uniboard Canada Inc.	no	no	Lavoie, G.	D4
Yvon Levesque	04-12320-98-REV3	Donohue/QUNO Inc.	no	no	Lavoie, G.	D4
Stephane Provost	04-12370-98-REV3	Norkraft Quevillon Inc.			Lavoie, G.	D4
John W. Arsenault	04-12388-98	Graybec Calc Inc. Usine de Bedford	no	no	Lavoie, G.	D4
Pierre Martin	04-12399-99-REV1	MDF La Baie Inc.	no	no	Lavoie, G.	D4
Marcel St-Onge	04-12615-99C	PCI Chemicals Canada Inc.	no	no	Lavoie, G.	D4
Maurice Lavoie	04-12706-00A-REV1	Norampac Inc.	no	no	Lavoie, G.	D4
Michel R. Rheaume	04-03738-99A-REV1	Hydro-Quebec Centrale Nucleaire Gentilly	yes	yes	Licea, J.A.	B5
M. Marcotte	04-09097-98-REV1	Agriculture Canada Centre de recherche et developpement sur les aliments	no	yes	Licea, J.A.	B9
Pierre Matte	04-10883-99	T'l'-Alarmes Microtec Inc.	no	no	MacLean, C.M.	C7
L.P. Normandeau	04-01185-99E	Hopital General de Montreal L'Institut de Recherche de l'Hopital General de Montreal			Poirier, J.C.	B5
Dr. Michel Barrette	04-02252-98F	Universite de Sherbrooke			Poirier, J.C.	B5
Louis Renaud	04-03346-98-REV1	Institut de Cardiologie de Montreal			Poirier, J.C.	E1
Jacques Sabourin	04-03621-98A-REV1	College Lionel-Groulx	no	no	Poirier, J.C.	E6
Alain Ouellette	04-03926-98-REV1	Ecole Polytechnique de Montreal			Poirier, J.C.	B5
Jean-Claude Dufour	04-04355-98B-REV1	Universite du Quebec	no	yes	Poirier, J.C.	E1
P.E. Bourque	04-05058-98-REV1	CEGEP de St-Laurent	no	no	Poirier, J.C.	E1
Guy Demers	04-07193-99-REV1	Universite du Quebec a Montreal			Poirier, J.C.	B5
Khaled Soliman	04-07916-99-REV1	Universite de Montreal Radioprotection / S.S.S.T.			Poirier, J.C.	B5
Dr. B.F. Long	04-08177-98A-REV2	Institut National de la			Poirier, J.C.	E1
Colette Tremblay	04-08582-99-REV1	Universite Laval			Poirier, J.C.	B5
Real Besner	04-12527-99K	Centre hospitalier de l'universite de Montreal	no	no	Poirier, J.C.	B1
Real Besner	04-12527-99L	Centre hospitalier de l'universite de Montreal	no	no	Poirier, J.C.	B1
Y2K Letters - Accelerators English						
Mr. Patrick Cadman	AECB-AOL-726-0	Saskatchewan Cancer Foundation/Saskatoon Cancer Centre	no	no		B4
Dr. Peter Dunscombe	AECB-AOL-754-0	CCO/Northeastern Ontario Regional Centre	no	no		B4
Ms. L.P. Normandeau	AECB-AOL-702-0	The Montreal General Hospital				B4
Mr. Narayan Kulkarni	AECB-AOL-752-0	Saint John Regional Hospital	no	no		B4

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Mr. John W. Andrew	AECB-AOL-736-0	Nova Scotia Cancer Care				B4
Mr. Abdel Mesbah	AECB-AOL-707-0	Newfoundland Cancer Centre				B4
Dr. Mazen Soubra	AECB-AOL-743-0	BC Cancer Agency/Victoria Cancer Clinic	no	no		B4
Dr. George A. Sandinon	AECB-AOL-731-0	Alberta Cancer Board/Tom Baker Cancer Centre	no	yes		B4
Dr. G.P. Raaphorst	AECB-AOL-762-0	CCO/Ottawa Regional Cancer Centre	yes/no	yes		B4
Dr. Nelson Videla	AECB-AOL-738-0	CCO/Toronto-Sunnybrook Regional Cancer Centre				B4
Micheline Gosselin	AECB-AOL-764-0	Sir Mortimer B. Davis - Jewish General Hospital	yes	yes		B4
J.A. Rawlinson	AECB-AOL-815-0	The Toronto Hospital/OCI/Princess Margaret Hospital	no	yes		B4
Mrs. J. Robins	AECB-AOL-766-0	CCO/Kingston Regional Cancer Centre	yes	yes		B4
Dr. Harry M. Johnson Ph.D.	AECB-AOL-771-0	The Manitoba Cancer Treatment & Research Foundation	no	no		B4
Dr. Sherali Hussein	AECB-AOL-777-0	Fraser Valley Cancer Centre	yes	yes		B4
Dr. T.A. Pickles	AECB-AOL-779-0	British Colombia Cancer Agency/Vancouver Clinic	no	yes		B4
Douglas R. Wyman Ph. D. FCCPM	AECB-AOL-783-0	CCO/Hamilton Regional Cancer Centre	yes	yes		B4
Dr. George A. Sandison	AECB-AOL-788-0	Alberta Cancer Board/Tom Baker Cancer Centre	no	yes		B4
Mr. Peter L. McGhee	AECB-AOL-791-0	CCO/Northwestern Ontario Regional Cancer Centre	yes	yes		B4
Dr. Harry M. Johnson Ph. D.	AECB-AOL-792-0	Manitoba Cancer Treatment & Research Foundation	no	no		B4
Matthew Schmid	AECB-AOL-793-0	Allan Blair Cancer Centre	yes	yes		B4
Douglas Wyman	AECB-ACA-795-0	CCO/Hamilton Regional Cancer Centre	?	yes		B4
Mr. John W. Andrew	AECB-AOL-798-0	Nova Scotia Cancer Centre	yes	yes		B4
Mr. Jake Van Dyk	AECB-AOL-800-0	CCO/London Regional Cancer Centre	yes	yes		B4
Dr. Wayne Allan	AECB-AOL-801-0	BC Cancer Agency Vancouver Island Cancer Centre	?	yes		B4
Alistair Baillie Ph. D. FCCPM	AECB-AOL-806-0	BC Cancer Agency Cancer Centre for the Southern Interior	no	yes		B4
Mr. John Grant	AECB-AOL-811-0	Cape Breton Healthcare Complex				B4
Mr. Christopher S. Davey	AECB-AOL-739-0	Alberta Cancer Board/Cross Cancer Institute	no	yes		B4
George A. Sandison	AECB-AOL-812-0	Alberta Cancer Board/Tom Baker Cancer Centre	no	yes		B4
Mr. Matthew Schmid	AECB-AOL-763-0	Saskatchewan Cancer Foundation/Allan Blair Memorial Cl.	no	yes		B4
Mr. Peter L. McGhee	AECB-AOL-715-0	CCO/Northwestern Ontario Regional Cancer Centre	yes	yes		B4
Dr. Harry M. Johnson Ph. D.	AECB-AOL-730-0	Manitoba Cancer Treatment & Research Foundation	no	no		B4
Dr. G.P. Raaphorst	AECB-AOL-712-0	Ottawa Regional Cancer Centre	yes/no	yes		B4
Mr. J.A. Rawlinson F.C.C.P.M.	AECB-AOL-760-0	Princess Margaret Hospital	no	no		B4
Dr. Douglas R. Wyman Ph. D.	AECB-AOL-703-0	CCO/Hamilton Regional Cancer Centre	yes	yes		B4
Dr. V.K. Prasanna Kumar	AECB-AOL-734-0	CCO/Windsor Regional Cancer Centre	yes	yes		B4
Mr. Jake VanDyk	AECB-AOL-701-0	CCO/London Regional Cancer Centre	yes	yes		B4

Name	Licence Number	Location	Response	Flag	LAO	Risk Class
Y2K Letters - Accelerators French						
Real Besner	CCEA-PEA-740-0	Centre hospitalier de l'universite de Montreal	no	no		B4
M. Daniel Letourneau	CCEA-PEA-772-0	Complexe hospitalier de la Sagamie	yes	yes		B4
Madame Annie Doiron	CCEA-PEA-775-0	Centre hospitalier de Gatineau				B4
Jean Pouliot	CCEA-PEA-784-0	Centre hospitalier de la radio-protection	yes	yes		B4
Normand Freniere	CCEA-PEA-789-0	H"pital Maisonneuve-Rosemont				B4
Clement Arsenault Ph. D.	CCEA-PEA-799-0	Centre oncologie Dr. Leon-Richard	no	no		B4
Monsieur Michel Goulet	CCEA-PEA-802-0	Centre hospitalier regional de Rimouski	no	no		B4
Renald Lemieux M. Ph. D.	CCEA-PEA-803-0	Centre universitaire de sante de l'Estrie (CUSE)				B4
Y2K Letters - Prescribed Substance Licences						
Robert Irving	PSL-125	Numet Engineering Limited.	no	yes	Licea	C4
Dr. L.J. Danielson	PSL-209	The Westaim Corporation	no	yes	Licea	C6
John Takala	PSL-184	Cameco Corporation	no	yes	Licea	C4
F. Stern	PSL-178	Stern Laboratories	no	yes	Licea	C7
Bryan Schreiner	PSL-111	Saskatchewan Research Council	no	yes	Licea	C4
S.D. Choubal	PSL-170	University of Saskatchewan	no	yes	Licea	C4
Ron Clark	PSL-90	Lakefield Research	no	yes	Licea	C4

Notes:

1. A blank in the response column indicates a missing response.
2. A ? in the response column indicates an incomplete response.
3. A yes/no in the response column indicates an ambiguous answer.
4. A blank or a no in the flag column indicates that the licensee was not flagged.

Table B-2: Flagged Responses

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
01-02172-99	Large Source >50 MBq	Yes	40 GBq Tc99m source	Unsealed.	-High. High dose rate possible. -Negligible. Potential access control issue. -Licensee to be contacted
05-03659-00A	Teletherapy Large Source >50 MBq		15 GBq Cs137 source	OCI Calitron	-High. High dose rate possible. -High. Custom computer controlled device. -Detailed device investigation.
05-03659-00C	Brachytherapy Large Source >50 MBq		37 GBq Ir192 370 GBq Ir192 444 GBq Ir192	Pulsed Selectron 180 Nucletron MicroSelectron Unsealed	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation. -High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation. -High. High dose rate possible. -Negligible. Potential access control issue. -Licensee to be contacted
05-03659-00D	Brachytherapy Large Source >50 MBq		370 TBq Co60 496 TBq Co60	OCI Hemitron Theratron 780-C	-High. High dose rate possible. -High. Custom computer controlled device. -Detailed device investigation. -High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 780 series not definitive. -Detailed device investigation.
05-03659-00E	Large Source >50 MBq		330 TBq Co60	Eldorado 8	-High. High dose rate possible. -High. Older unit, near end of life, possible field modification to install digital timer. -Detailed device investigation.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
05-03659-97E-REV1	Large Source >50 MBq		4070 GBq Pu238 413 MBq Cf252	Monserco Calcium Unit Total Body Nitrogen Measurement Unit	Both units require further investigation (no information available).
05-03659-98A (now –00G)	Large user; all 3659 responses flagged.		113 TBq Cs137 156 TBq Cs137 120 TBq Cs137	GammaCell 3000 Elan GammaCell 40 GammaCell 1000	-Low. Source internal to irradiator. -Negligible. Date used for decay time and irradiation timer only. -No action. (Applies to all GammaCell units.)
05-11000-98-REV2 (revoked)	Licensee history (Theratronics).				Closed. License revoked.
05-11001-98A-REV2 (now –00A)	Unique device. Pool irradiator. Large source.		111 PBq Co60 3700 TBq Co60	JS-8900 UC-15	-High. High dose rate possible. -High. Custom device. -Detailed device investigation. (Applies to both units.)
05-11001-98C-REV1 (now –00C)	Manufacturer.		Numerous sealed and unsealed sources. E.g. 1200 PBq Co60.		-High. High dose rate possible. -Negligible. Potential access control issue. -Licensee to be contacted
05-11001-98G-REV1 (now –00G Rev 1)	Manufacturer.		Numerous Co60 and Cs137 sources >10 TBq	Numerous GammaCell, GammaBeam, Phoenix and Elite models.	-High. High dose rate possible. Manufacturer. -Negligible, with possible exception of GammaBeam. -Detailed investigation of GammaBeam.
05-11336-99A	Information provided.		944 TBq Co60	GammaCell 220	-Low. Source internal to irradiator. -Negligible. Date used for decay time and irradiation timer only. -No action. (Applies to all GammaCell units.)
08-07347-99A	Conditional on "Provided utilities are running".		81 TBq Co60 23 TBq Cs137	GammaCell 220 GammaCell 1000	-Low. Source internal to irradiator. -Negligible. Date used for decay time and irradiation timer only. -No action. (Applies to all GammaCell units.)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
05-08324-99	Large Source >50 MBq		185 MBq Ba133 source	Campbell Engineering Co. K Series	-Dose rate low. -n.a. -Closed
05-08785-00	Device manufacturer		18500 TBq H3 source	Unsealed source	-High. High dose rate possible. -Negligible. Potential access control issue. -Licensee to be contacted
05-08785-98A-REV2	Device manufacturer		6200 GBq H3 source (max) 1100 kBq Cs137	Many devices Beckman Counter	-High. High dose rate possible. -All safety lights with no digital aspects. -Closed. -Low. Dose rate low. -Computer controlled. -Closed (dose rate low).
05-11341-97-REV2	Device manufacturer		11000 TBq H3	Source	-High. High dose rate possible. -Negligible. Potential access control issue. -Licensee to be contacted
05-11341-98	Device manufacturer		740 GBq H3 (max)	Many devices	-High. High dose rate possible and many devices. -All safety lights with no digital aspects. -Closed.
05-01480-98A-REV1	"Y2K is an issue for some of our other licences, not this one." Changed answer on form.	Yes (Yes/No)	440 TBq Co60	Eldorado 78	Closed. Licence revoked due to hospital merger. Replaced by 05-12758-00A.
05-12609-98BA-REV1	Teletherapy	Yes	496 TBq Co60 496 TBq Co60	Theratron 780 Theratron 780-C	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 780 series not definitive. -Detailed device investigation. (Applies to both devices.)
05-12609-98BB-REV1	Brachytherapy HDR	Yes	370 GBq Ir192 source	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
05-12609-98BE-REV1	Brachytherapy LDR	?	15 GBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
05-12609-99A	Teletherapy	Yes	450 TBq Co60 450 TBq Co60	Theratron 780 Theratron 780-C	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 780 series not definitive. -Detailed device investigation. (Applies to both devices.)
05-12609-99AG	Brachytherapy HDR	Yes	370 GBq Ir192 source	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
05-12609-99AK	Teletherapy	Yes	320 TBq Co60	Theratron 780	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 780 series not definitive. -Detailed device investigation.
05-12609-99AM	Brachytherapy LDR	Yes	13 GBq Cs137	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
05-12609-99AU-REV1	Brachytherapy LDR	Yes	1 GBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
05-12609-99AW	Brachytherapy LDR	Yes	370 GBq Ir192 source (approx.)	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
05-12609-99C	Brachytherapy LDR	Yes	50 GBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
07-01766-99F	Brachytherapy LDR Changed answer. Provides supplier information.	Yes (Yes/No)	28 GBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
09-06074-98-REV3	Teletherapy		555 TBq Co60 source	Theratron 780C	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 780 series not definitive. -Detailed device investigation.
09-06074-98C-REV2	Brachytherapy LDR		2 GBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
09-06704-98G-REV1	Brachytherapy HDR		444 GBq Ir192 source	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
00-11708-99-REV3	Inconsistent with corporate response (see 11710).		19 GBq Cs137 89 GBq Cs137 28 GBq Cs137 74 GBq Cs137 7400 MBq Cs137 19 GBq Cs137 56 GBq Kr85 3700 MBq Cs137 19 GBq Cs137 20 GBq Pm147	Ohmart SHGS-1 Ohmart SHLG-1 Ohmart SHRM-B Ohmart HM-8 Ohmart SHSP Ohmart SHD AccuRay O-7 Kay-Ray 7062B & 7062 BP Ronan SA-8 Measurex 4201	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
00-11709-99-REV1	Yes.	Yes	4440 MBq Cs137 37 GBq Pm147 56 GBq Kr85 5550 MBq Am241	Ohmart SH-F1 AccuRay 0-7 AccuRay 0-7 NDC Systems 104F/104PD	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices, except NDC unit) -Low. Dose rate low. -n.a. -Close (dose rate low).
02-02787-99	Refers to manual operation only.		74 GBq Cs137 111 GBq Cs137 56 GBq Cs137 370 GBq Cs137	Ohmart HM8 Ohmart ED-12 Ohmart SR-1A Ronan Engineering SA-1	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
03-01043-98-REV3	Large corporation (Irving), expected corporate response.		74 GBq Cs137 3700 GBq Cs137	Kay-Ray 7063 and 7063P Kay-Ray 7062B and 7062BP	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
05-01371-97E-REV2	Source used for development and testing.		1480 MBq Cd109	Sealed	-Low. Target level of safety cannot be exceeded. -Not evaluated. -No action.
05-06010-00	Development and testing.			Large list of Sentrol Systems and Valmet gauges. Nucleonic Data Systems 100B	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
05-06408-98-REV3	Device manufacturer/supplier. Provided information.			Large list of Ronan gauges	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
05-11710-99-REV1	Corporate Y2K co-ordinator provided Yes.	Yes	37 GBq Kr85 4440 MBq Cs137 19 GBq Cs137 19 GBq Cs137 37 GBq Kr85 2960 MBq Am241	Measurex 2201 Ohmart Sh-F1 Ohmart SHD Texas Nuclear 5038/5038B Measurex 4201 NDC Systems 104/104F	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices, except NDC unit) -Low. Dose rate low. -Not evaluated. -Closed (dose rate low).
05-12008-98-REV3	Inconsistent with corporate response (see 11710).		74 GBq Cs137 74 GBq Cs137 37 GBq Kr85 370 GBq Cs137 3700 MBq Cs137 185 GBq Cs137 20 GBq Pm147 74 GBq Cs137	Ohmart HM-8 Texas Nuclear 5130 Measurex 2201 Ronan SA-1 Kay-Ray 7062 & 7062/P Berthold 7442 & 7442D & 7442L Measurex 4201 Kay-Ray 7063 & 7063P	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices except NDC units)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
			2960 MBq Am241	NDC 104 & 104F	-Low. Dose rate low. -N/A. -Close (dose rate low).
05-12120-99	Information provided.		370 GBq Cs137 3700 MBq Cs137	Ronan SA-1 Ohmart SH-100	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
08-01802-99	Legal-type letter.		148 GBq Cs137 37 GBq Cs137 37 GBq Cs137 37 kBq Ra226	Texas Nuclear 5096 Ohmart SHLM Ohmart SHLM-C2 Sealed	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices) -Dose rate low. -n.a. -Closed (dose rate low).
08-01824 -98A-REV3	Inconsistent with corporate response (see 1802).		74 GBq Cs137 1850 GBq Cs137 2400 GBq Cs137 19 GBq Cs137 56 GBq Cs137 37 GBq Cs137 11 GBq Cs137 370 GBq Cs137 44 kBq Ra226 19 GBq Cs137	Texas Nuclear 5191 Texas Nuclear 5178 Texas Nuclear 5201 Ohmart SHD Ohmart SR-1A Ohmart SMLM13-1 Ohmart SHLMC-1 Ronan SA-1 Sealed Texas Nuclear 5202	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
08-08180-97-REV2	Annotated that response based on conversation with G. Lavoie.		37 GBq Cs137	Berthold LB 7440/7440D/7440L	
08-11242-97-REV1	Provided information.		4810 MBq Cs137 19 GBq Cs137 18 GBq Cs137 148 GBq Cs137	Ohmart SR-A Ohmart SHD Ohmart SHRM-B Ohmart ES-3 Shutterless	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
08-11653-98-REV1	Provided information.		50 MBq Cf252 1850 MBq Cs137 3700 MBq Cs137 37 GBq Cs137 37 GBq Co60 89 GBq Cs137 74 GBq Cs137 15 GBq Kr85 3700 MBq Cs137 296 MBq Co60 444 MBq Co60 2960 MBq Am241	Ohmart SHN Ohmart SHWA Kay-Ray 7062 & P Berthold 7440/D/L Berthold 7444/7444D/7444L Ohmart SHLG-1 Kay-Ray 7063/7063P Lippke MV-KR Kay-Ray 7062B/7062BP Berthold LB 300L/ Type 100 Berthold LB 300L/ Type 120 NDC 104 & 104P	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (Applies to all listed devices, except NDC unit.) -Low. Dose rate low. -N/A. -Close (dose rate low).
08-12718-00	Legal-type letter attached.		3700 MBq Cs137	Kay-Ray 7062B/7062BP	-High. High dose rate possible.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
					-Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
09-01988-98	Provided information.		4070 MBq Cs137 148 MBq Cs137 74 GBq Cs137 2590 MBq Sr90 3700 MBq Cs137 56 GBq Rv85 370 GBq Cs137 4810 MBq Cs137 3700 MBq Co60 37 GBq Cs137 296 MBq Co60 37 GBq Pr147	Ohmart SHRM-PA AccuRay LS-101 AccuRay (NRC) SH-300 AccuRay 0-7 Kay-Ray 7062B/ 7062BP AccuRay 0-7 Ronan SA-1 Ohmart SR-A Berthold LB 7442... Berthold LB 7440... Berthold LB 300L/T100 ABB TG-4	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
09-03838-98-REV3	Refers to test plan.		185 GBq Cs137 11 GBq Kv85 3700 MBq Cs137 7400 MBq Cs137	Ohmart HM-8 Measurex 1201 Kay-Ray 7062B/..BP Kay-Ray 7063/..P	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices except NDC)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
			19 GBq Cs137 3700 MBq Cs137 37 GBq Cs137 19 GBq Cs137 296 MBq Co60 4440 MBq Cs137 2960 MBq Am241	Ronan SA-1 Ohmart SHRM Berthold 7440/...D/...L Ronan SA-8 Berthold LB 300-L Type 100 Ohmart SH-F1 NDC Sys. 104/104F	-Low. Dose rate low. -N/A. -Close (dose rate low).
09-04854-99	Refers to supplier information.		185 GBq Cs 137 370 GBq Cs137 74 GBq Cs137 185 GBq Cs137 370 GBq Cs137	Ohmart SR-2 Ronan SA-1 Kay-Ray 7063/..P Texas Nuclear 5176 Texas Nuclear 5204	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
09-05050-98-REV2	Provided test information.		74 GBq Cs 137 1110 MBq Cs137 3700 MBq Am241/Be 370 GBq Cs137 33 kBq Ra226 296 MBq Co60	Ohmart HM-8 Noratom Norcontrol NOR4041 Noratom Norcontrol NOR4088 Ronan SA-1 Sealed Berthold 300L T80	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
			444 MBq Co60 185 GBq Cs137 296 MBq Co60	Berthold 300L T120 Berthold 7442 Berthold 300L T100	
09-11718-99C	Top of response form cut off on fax.	?	185 GBq Cs137 37 GBq Cs137 4070 MBq Cs137 740 MBq Cs137 12 GBq Am241	Ohmart HM-8 Ohmart SR-1 Ohmart SHRM Scan Tech 2500 Scan Tech 2500	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
09-12198-97-REV2	Provided supplier statement.		370 GBq Cs137 740 MBq Cs137 12 GBq Am241	Ronan SA-1 Scan Tech 2500 Scan Tech 2500	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
03-02107-98A-REV1	Large corporation (NBEPC), expected corporate response.		74 GBq Cs137	Atlan-Tech Panarad Shield PS8-12	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted.
03-06469-98-REV2	Large corporation (NBEPC), expected corporate response.		50 GBq Cs137 9620 GBq Cs137	J.L. Shepherd 142-10 J.L. Shepherd 89 Calibrator	-High. High dose rate possible. -Negligible. No date dependent components. No external control issues. -No action. (Applies to all J.L. Shepherd units.)
05-01362-99A-REV3	Legal-type letter. Large consolidated licence holder.	Yes	37 TBq Cs137 1110 GBq Cs137 7400 MBq Cs137	J.L. Shepherd 81-12B J.L. Shepherd 81-10 J.L. Shepherd 28-5	-High. High dose rate possible. -Negligible. No date dependent components. No external control issues. -No action.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
					(Applies to all J.L. Shepherd units.)
			4810 GBq Cs137	J.L. Shepherd 89 Calibrator	
			3700 MBq Cs137	Bicron NE 6610C	-High. High dose rate possible.
			18500 kBq Sr90	Bicron NE 8800G	-High. For 8800G, vendor noted non-compliance in software/firmware, with no fix available. For 6610, vendor has not evaluated. -Detailed device investigation.
			1850 MBq Cd109	Niton XL Model 309	-Low. Target level of safety cannot be exceeded. -Not evaluated. -Closed. Dose rate low.
			3700 MBq Am241	Siemens Env. Systems Ltd.	-Low. Target level of safety cannot be exceeded. -Not evaluated. -Closed. Dose rate low.
05-08098-97-REV1	Large source >50 MBq		148 PBq Co60	IR-108	-High. High dose rate possible. -High. Custom device. -Detailed device investigation.
05-12470-99	Other OH response (1362) said Yes.		3 PBq H3	Unsealed	Sources -High. High dose rate possible.
			150 GBq 2-89	Unsealed	-Negligible. Potential access control issue. -Licensee to be contacted
			4 MBq >89	Unsealed	
			74 MBq Am241	Unsealed	Devices -High. High dose rate possible.
			350 GBq 2-89	Sealed	-Cannot determine due to possible field modifications.
			740 MBq >89	Sealed	-Licensee to be contacted. (applies to all listed devices)
			37 MBq Am241	Sealed	

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
			370 MBq Cs137 1850 MBq Am241/Bc 370 MBq Am241/Bc 555/370 MBq Ni63 185 MBq Cd109 1665 MBq Fe55 7400 MBq Am241 3700 MBq Cs137	Troxler 3400 Troxler 3400 Troxler 3422 Various (3) Texas Nuclear 9277 Texas Nuclear 9277 BOT Poletester XP1 Ronan Engineering SA-6	
05-09943-00	Large source >50 MBq		555MBq Ni63 370 MBq Ni63 7400 MBq H3	Perkin Elmer detector Valco Instruments ScienTech LBF-3	-Low. Target level of safety cannot be exceeded. -Not evaluated. -Closed (low dose rate). (Applies to both devices with Ni63 source.) -Low. Target level of safety unlikely to be exceeded. -Not evaluated. -Closed (dose rate low).
05-11013-98B-REV1	Device manufacturer		555 MBq Ni63	IONSCAN	-Low. Target level of safety cannot be exceeded. -Not evaluated. -No action.
05-07264-98-REV1	Device manufacturer		Various sources.	Various.	- No source capable of 1 mSv in 8 hours. - n.a. -Closed
09-06074-98E-REV1	Large source >50 MBq		440 TBq Cs137 source	J.L. Shepherd 81-14R	-High. High dose rate possible. -Negligible. No date dependent components. No external control issues. -No action.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
05-03694-97-REV1	Annotation regarding LSC's and survey meters being compliant.		370 MBq Fe55	Sealed source	Low. Target level of safety cannot be exceeded. -Not evaluated. -No action.
02-12278-98P-REV1	Brachytherapy LDR Annotated "no chips/date not hooked to any other units".		50 GBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
02-12278-98R-REV1	Teletherapy Annotated "no chips/date not hooked to any other units".		555 TBq Co60	Theratron 1000	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 1000 series not definitive. -Detailed device investigation.
02-12278-98T-REV1	Brachytherapy HDR Provided test data (form incomplete).	Yes	370 GBq Ir192 source	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
05-01466-99D (revoked)	Brachytherapy LDR	Yes			-Closed (revoked).
07-01764-97A-REV2	Teletherapy	Yes	555 TBq Co60	Theratron 1000	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 1000 series not definitive. -Detailed device investigation.
07-01764-97C-REV4	Brachytherapy HDR	Yes	370 GBq Ir192 source	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
08-01831-99	Brachytherapy LDR		800 MBq Cs137 source	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
08-01831-99C	Brachytherapy HDR		370 GBq Ir192 source	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
					-Detailed device investigation.
09-04976-98	Brachytherapy LDR "Maybe."	Yes (Yes/No)	20 GBq Cs137	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
04-01179-97-REV4	Therapy	Yes	444 GBq Ir192	GammaMed 12I	Recent corporate change in ownership to Nordion. Information not available. Requires follow-up.
04-01186-97A-REV2	Therapy HDR	Yes	370 GBq Ir192	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
04-01186-98E-REV3	Teletherapy			Theratron 1000 Eldorado 78	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 1000 series not definitive. -Detailed device investigation. -High. High dose rate possible. -High. Older unit, near end of life, possible field modification to install digital timer. -Detailed device investigation.
04-12258-98Y-REV2	Teletherapy		30 GBq Cs137	Nucletron Selectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
04-12258-98Z-REV1	Teletherapy		370 GBq Ir192	Nucletron MicroSelectron	-High. High dose rate possible. -High. Supplier identified possible safety hazard, depending on firmware version. -Detailed device investigation.
04-12258-99U-REV2	Teletherapy		496 TBq Co60	Theratron 780C	-High. High dose rate possible. -High. Unique supplier with prior software issues. Statement on earlier versions of 780 series not definitive. -Detailed device investigation.
04-01086-98-REV2	Inconsistent with corporate		74 GBq Cs137	AccuRay (NRC) SH-300	-High. High dose rate possible.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
	response (see 11710).		1850 MBq Cs137 37 GBq Kr85 19 GBq Cs137 74 GBq Cs137	Nuclear Research LS-101 Measurex 2201 Ohmart SHD Nuclear Research SH352	-Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-02142-99-REV1	Provided information.		19 GBq Kr85 3700 MBq Cs137 37 GBq Kr85 19 GBq Cs137 3700 MBq Cs137 4810 MBq Cs137 19 GBq Cs137 370 GBq Cs137	Sentrol Systems Profilograph Ohmart SHRM Measurex 2201 Ronan SA-8 Ohmart SH-100 Ohmart SR-A Ohmart SHD Ronan SA-1	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-03080-98-REV1	Provided information.		74 GBq Cs137 19 GBq Kr85 28 GBq Cs137 19 GBq Cs137 370 GBq Cs137 19 GBq Cs137 37 GBq Pr147	Ohmart HM-8 Accuracy 0-3 Ohmart SHRM-B Ohmart SMD Ronan SA-1 Ronan SA-8 ABB TG-4	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
04-03123-99	Large corporation (Noranda), expected corporate response.		185 GBq Cs137 19 MBq Cs137 2400 MBq Cs137 19 GBq Cs137	Texas Nuclear 5183 Texas Nuclear 5202 Texas Nuclear 5201 Texas Nuclear 5190	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-05468-98-REV2	Form not filled in. Sent letter instead.		74 GBq Cs137 555 GBq Kr85 3700 MBq Sr90 19 MBq Kr85 19 MBq Sr90	Kay-Ray 7063/7063P AccuRay U-7 AccuRay U-7 Adaptive Technologies AT-100 Adaptive Technologies AT-100	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-05940-98A-REV1	Other Kruger response provided information (see 3080).		37 GBq Kr85 56 GBq Kr85 19 GBq Cs137 28 GBq Cs137 37 GBq Cs137 185 GBq Cs137 3700 MBq Cs137 4810 MBq Cs137 4440 MBq CS137 20 GBq PR147	Measurex 2201 AccuRay 0-7 Ohmart SMD Ohmart SHRM-B Ohmart SR-1 Ohmart SR-2 OhmartSH-100 Ohmart SR-A Ohmart SH-F1 Measurex 4201	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices except NDC)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
			2960 MBq Am241	NDC Sys 104 & 104F	-Low. Dose rate low. -N/A. -Close (dose rate low).
04-08826-98-REV2	Late response. Sent letter. Form not returned.	?	370 GBq Cs137 7400 MBq Cs137 7400 MBq Cs137 1850 MBq Cs137 19 GBq Cs137 7400 MBq Cs137 3700 MBq Cs137	Ronan SA-1 Texas Nuclear 5201 Texas Nuclear 5200 Texas Nuclear 5211 Texas Nuclear 5202 Texas Nuclear 5205 Ohmart SH-100	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-11711-99-REV1	Inconsistent with corporate response (see 11710).		37 GBq Kr85 19 GBq Cs137 3700 MBq Cs137	Measurex 2201 Ohmart SHD Ohmart SH-100	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-11723-99	Provided test information.		28 GBq Co60 3700 MBq Am241	Ohmart SHLG-3 Berthold 2135000000 Siempelkamp	-High. High dose rate possible. -Cannot determine due to possible field modifications. -Licensee to be contacted. (applies to all listed devices)
04-03738-99A-REV1	Provided information.	Yes	74 GBq Cs137 10 TBq Cs137 4810 GBq Cs137 11100 GBq Cs137	J.L. Shepherd 142-5 and 142-10 J.L. Shepherd 81-10 J.L. Shepherd Calibrator J.L. Shepherd 89 Calibrator	-High. High dose rate possible. -Negligible. No date dependent components. No external control issues. -No action. (Applies to all J.L Shepherd units.)

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
04-09097-98-REV1	Large source >50 MBq		5500 TBq Co60	AECL 651 PT	-High. High dose rate possible. -High. Custom device. -Detailed device investigation. (Applies to both units.)
04-04355-98B-REV1	Large source >50 MBq		Various sealed sources.	N/A.	- No source capable of 1 mSv in 8 hours. - n.a. - Closed.
AECB-AOL-731-0	Refers to contracts with suppliers to justify No response.			Siemens Mevatron KD Siemens Mevatron MD-2	-High. High dose rate possible. -No risk as per vendor statement. -Closed. (Applies to both Siemens units.)
AECB-AOL-762-0	Ambiguous answer. Seems to dispute compliance statement by Siemens	Yes (Yes/No)		Varian Clinac 2100 C	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-764-0	Yes. Information provided.	Yes		Varian Clinac 2100 C	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-815-0	Random accelerator selection.			Varian Clinac 2100 C/D Varian Clinac 2100 C Philips SL-25	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation. (Applies to both Varian units and the Philips unit.)
AECB-AOL-766-0	Yes.	Yes		Varian Clinac 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
AECB-AOL-777-0	Yes.	Yes		Philips SL-20	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-779-0	"As per discussion with Dr. E. Blackmore, TRIUMF."			Custom unit for proton therapy.	-High. High dose rate possible. -High. Custom device. -Detailed device investigation.
AECB-AOL-783-0	Yes.	Yes		Varian Clinac 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-788-0	Refers to contracts with suppliers to justify No response.			Varian Clinac 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-791-0	Yes.	Yes		Varian Clinac 2300 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-793-0	Yes.	Yes		Varian Clinac 2100 C	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-ACA-795-0	No answer.	?		Varian Clinac 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-798-0	Yes. Test information provided	Yes		Varian Clinac 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
					specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-800-0	Yes.	Yes		Varian Clinac 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-801-0	No response provided.	?		Varian Clinac 21 EX	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-806-0	Referred to supplier website to justify No response.			Philips Elekta SL-20	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-739-0	Attempt to add all sources under 1832.			Varian Clinac 2300 C/D Varian Clinac 2100 C	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation. (Applies to both Varian units.)
AECB-AOL-812-0	Refers to contracts with suppliers to justify No response.			Not determined.	Requires device identification.
AECB-AOL-763-0	Companion response (793) said Yes.			Siemens Mevatron 77	-High. High dose rate possible. -No risk as per vendor statement. -Closed.
AECB-AOL-715-0	Yes.	Yes		Siemens Mevatron KD	-High. High dose rate possible. -No risk as per vendor statement. -Closed.
AECB-AOL-712-0	Ambiguous answer. Seems to dispute compliance statement by Siemens.	Yes (Yes/No)		Siemens Mevatron KD-2 Siemens Mevatron MD-2	-High. High dose rate possible. -No risk as per vendor statement. -Closed.

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
					(Applies to both Siemens units.)
AECB-AOL-703-0	Yes.	Yes		Varian Clinac 2100 C	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-734-0	Yes.	Yes		Philips SL-25	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
AECB-AOL-701-0	Yes.	Yes		Varian Clinac 2100 C/D Varian Clinac 2100 C	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation. (Applies to both Varian units.)
CCEA-PEA-772-0	Yes.	Yes		Varian 2100 C/D	-High. High dose rate possible. -Negligible to high. Identified non-compliance has no safety related impact for specified hardware and software platforms. -Detailed device investigation.
CCEA-PEA-784-0	Yes.	Yes		Siemens Mevatron KD-2	-High. High dose rate possible. -No risk as per vendor statement. -Closed.
PSL-125	PSL				As per MRD staff, only to be undertaken if time permits. Evaluation deferred.
PSL-209	PSL				As per MRD staff, only to be undertaken if time permits. Evaluation deferred.
PSL-184	PSL				As per MRD staff, only to be undertaken if time permits. Evaluation deferred.
PSL-178	PSL				As per MRD staff, only to be undertaken if time permits. Evaluation deferred.
PSL-111	PSL				As per MRD staff, only to be undertaken if

Licence Number	Initial Flagging Reason	Self Flag?	Hazard Assessment	Configuration or Device Type	-Risk Element Identified -Y2K Susceptibility/Compliance -Status/Follow-Up Suggested
					time permits. Evaluation deferred.
PSL-170	PSL				As per MRD staff, only to be undertaken if time permits. Evaluation deferred.
PSL-90	PSL				As per MRD staff, only to be undertaken if time permits. Evaluation deferred.

Table B-3: Specified Devices Examined Within Flagged Licenses

ABB TG-4
AccuRay (NRC) SH-300
AccuRay 0-7
AccuRay LS-101
AccuRay U-7
Adaptive Technologies AT-100
AECL 651 PT
Atlan-Tech Panarad Shield PS8-12
Beckman Counter
Berthold 2135000000 Siempelkamp
Berthold 7440/7440D/7440L
Berthold 7442/7442D/7442L
Berthold 7444/7444D/7444L
Berthold LB 300-L Type 100
Berthold LB 300-L/Type 120
Bicron NE 6610C
Bicron NE 8800G
BOT Poletester XP1
Campbell Engineering Co. K Series
Eldorado 78
Eldorado 8
GammaCell 1000
GammaCell 220
GammaCell 40
GammaMed 12I
IR-108
J.L. Shepherd Calibrator
J.L. Shepherd 142-10
J.L. Shepherd 142-5 and 142-10
J.L. Shepherd 28-5
J.L. Shepherd 81-10
J.L. Shepherd 81-12B
J.L. Shepherd 81-14R
J.L. Shepherd 89 Calibrator
JS-8900
Kay-Ray 7062 & 7062/P
Kay-Ray 7062B & 7062 BP
Kay-Ray 7063 & 7063P
Lippke MV-KR
Measurex 1201
Measurex 2201
Measurex 4201
Monserco Calcium Unit
NDC 104 & 104F
NDC Systems 104F/104PD
Niton XL Model 309
Noratom Norcontrol NOR4041

Noratom Norcontrol NOR4088
Nuclear Research LS-101
Nuclear Research SH352
Nucleonic Data Systems 100B
Nucletron MicroSelectron
Nucletron Selectron
OCI Calitron
OCI Hemitron
Ohmart SHSP
Ohmart ED-12
Ohmart ES-3 Shutterless
Ohmart HM-8
Ohmart HM8
Ohmart SH-100
Ohmart SH-F1
Ohmart SHD
Ohmart SHGS-1
Ohmart SHLG-1
Ohmart SHLG-3
Ohmart SHLM
Ohmart SHLM-C2
Ohmart SHN
Ohmart SHRM
Ohmart SHRM-B
Ohmart SHRM-B
Ohmart SHRM-PA
Ohmart SHWA
Ohmart SR-1A
Ohmart SR-2
Ohmart SR-A
OhmartSH-100
Perkin Elmer detector
Philips SL-20
Philips SL-25
Ronan Engineering SA-6
Ronan SA-1
Ronan SA-8
Scan Tech 2500
Sentrol Systems Profilograph
Siemens Env. Systems Ltd.
Siemens Mevatron 77
Siemens Mevatron KD
Siemens Mevatron KD-2
Siemens Mevatron MD-2
Texas Nuclear 5038/5038B
Texas Nuclear 5096
Texas Nuclear 5130
Texas Nuclear 5178
Texas Nuclear 5183

Texas Nuclear 5191
Texas Nuclear 5200
Texas Nuclear 5201
Texas Nuclear 5202
Texas Nuclear 5202
Texas Nuclear 5211
Theratron 1000
Theratron 780
Theratron 780C
Total Body Nitrogen Measurement Unit
Troxler 3400
Troxler 3422
UC-15
Varian Clinac 21 EX
Varian Clinac 2100 C
Varian Clinac 2100 C/D
Varian Clinac 2300 C/D

Appendix C: Work Arounds and Resources for Some Y2K Problems

1. Year 2000 Solutions (http://www.y2kfixes.com) has put together a compliance package that solves both the hardware problem and the software problem for desktop PC's. It is called Compliance 2000™. This kit contains a Millennium BIOS Board™ (hardware solution), a preparedness booklet of choice and Fix2000™ Pro which fixes your software at the machine code level.

2. Year 2000 Solutions (http://www.y2kfixes.com) Millennium BIOS Board™ This board brings any non-compliant 286, 386, 486, Pentium or compatible computer system into hardware compliance on "Boot-up" by just plugging it into any open ISA slot. Has a "Smart Mode" which corrects the Crouch-Echlin effect or the latency problem in the RTC (Real Time Clock) instantly and without additional software. No other hardware solution automatically corrects the RTC. Not Operating System Specific. Virus Proof, Fail-Safe. Warranty provided.

3. Intelliquis (http://www.intelliquis.com)has released Fix2000™ Pro that not only checks PCs for Y2K compliance, it also modifies your software program files at the machine code level without violating your software license. This product will remediate up to 90% of the common shrink wrapped software. Best when used in conjunction with the Millennium BIOS Board™ from Year 2000 Computer Solutions.

4. Hendela Systems Consultants, Inc. (http://www.scany2k.com) has released the SCANALYZER YEAR 2000 SOLUTION software. This software is designed to locate and identify computer program code which may need to be updated to become Year 2000 compliant. The program can be used by all mainframe, LAN and workstation environments which can export text files to Windows 3.1x or Windows '95 PCs and is said to be compatible with all text based programming languages such as Nomad, Foxpro, RPG, COBOL and C.

5. Cap Gemini America (http://www.capgemini.com) offers a Year 2000 renovation to specification within four weeks guaranteed. The warranty applies only to actual code repair for COBOL code running under MVS, in batches of 750,000 to 1.5 million lines of code AFTER Cap Gemini and the client have identified the code areas to fix. That means the customers or vendors still have to assess the software, decide which is most critical to repair and put it back into production and test it. This latter part represents 80% of the work time and effort while the guaranteed part represents 20% of the time frame or effort.

6. SURVIVE 2000 - A PC Compliance Identifier Kit (http://www.survive-2000.com) is a software designed to identify basic year 2000 compliance problems on PCs.

First it tests the computer's BIOS and provides a printed report of whether or not it is compliant and then provides a database of vendors who have "fixes" available. This takes about 5 minutes. Then the Kit tests the operating system and gives you a printed report with a list of vendors that provide upgrade paths. Finally it examines the hard drive and generates a full report of all executable files on the hard disk, their version number, install date and version number and the vendor of that software. Then it shows you how to get the information to fully upgrade the noncompliant software in the most economical way.

7. Mark Gibson, reports @COMPUTER WEEKLY, has published a review of 16 so-called "software fixes" for PC YEAR 2000 non compliance problems. He warns that many "flash software" or "Terminate and stay resident" (TSR) fixes for four digit date fixes to the operating system, should not be relied upon. He points out that flash fixes may cancel out or interfere with flash fixes supplied by the BIOS suppliers. Further that TSR fixes residing on hard drives can be deleted making a machine non-compliant again. The only absolute or reliable fixes for non compliant systems are hardware fixes such as Fernlink's Millennium BIOS Board™ which plugs into the mother board and provides a permanent fix.

8. Guidance for imbedded chips Year 2000 problem. The Institute of Electrical Engineers (IEE) in Great Britain, has published a 150 page booklet aimed at telling business managers how best to cope with the problem of embedded microchips affected by the Millennium Bug. It costs 50 British pounds and the US IEE probably has an American version available.

9. Y2K Audit and Embedded Systems Services.
(http://www.y2kmsi.com)
Y2K Audit and Embedded Systems Services of New Jersey headquartered Year 2000 Management Services, Inc. (Y2KMSI) Provides specialized services to manufacturing companies by AIAG (Automotive Industry Action Group) Certified Engineers using the AIAG evaluation process, manufactures alike. Embedded Systems Inventory, Assessment and Testing services are provided by highly experienced Y2K Embedded Systems Engineers following an effective and cost efficient methodology.
Published: (Year 2000.com Announcement List, March 9, 1999)

Appendix D: Detailed Y2K Compliance Questionnaire

For each of the listed devices it is required that you provide the following information:

1. Does the device contain, exchange information with or have external control components which process digital information? (Yes/No/Unknown)
2. If you answered yes to question #1, is your device Year 2000 compliant as per the attached definition and testing criteria? (Yes/No/Unknown)
3. If your device is deemed to be Year 2000 compliant please provide a copy of the test criteria and results.
4. If your device is deemed to be non-Year 2000 compliant:

- Do you have a plan to make the device Year 2000 Compliant? (Yes/No). If yes, please provide a copy of the plan.
- Is there an acceptable and tested work-around (i.e. manual operation of the device vice computer controlled). If so please provide details of the work-around and test criteria and test results.
- Do you plan to support the device post Year 2000?

YEAR 2000 COMPLIANCE

Year 2000 Compliance Definition
Information technology that is Y2K compliant shall be able to accurately process dates and date-related data (including, but not limited to, calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations, to the extent that other information technology, used in combination with this information technology properly exchanges date data with it [Ref. 3].

Year 2000 Compliance vs. Readiness
Essentially the difference between Year 2000 readiness and compliance is the difference between a business process or function and a physical system. A system is Year 2000 *compliant* if it functions as it was designed to in a Year 2000 environment. On the other hand, a function or process is Year 2000 *ready* if, in a Year 2000 environment, is continues to perform without disruption either because the systems supporting it are compliant, or because a contingency plan has been invoked.

For the purposes of the AECB, you must demonstrate, as a minimum, Year 2000 readiness.

MANDATORY ELEMENTS OF A Y2K CONTINGENCY PLAN

A Year 2000 contingency plan establishes alternative Year 2000 resolution options when an initial action plan falls short of its goal. Clearly, however, there is not time to develop contingency plans for all considerations, therefore a prioritization of business functions will highlight those systems/functions for which contingency planning should occur. While there is no set form for a Year 2000 contingency plan, there are themes or areas of discussion that should be included in order for the plan to adequately address organizational requirements. These elements are described below:

Programmatic Section
This section details the plans for system remediation management, and describes management of resources that can be operated in reduced or minimal modes. It addresses the actions to be performed when a foreseen Y2K problem results in degraded system performance. An example of this sort of contingency is when, it is discovered that some external interface has serious problems and there is no time left, given its priority, to fully remediate all the input and output conversion capabilities. This could happen, for example, in a payroll application. Data sources containing non-compliant date formats could not be fixed as quickly as the majority of sources. Then a contingency activity might be to plan for a conversion engine, perhaps involving separate computer facilities to reformat the data from the

few non-compliant sources as a stopgap until the fully compatible form is available, possibly after the Year 2000 deadline.

Mission-Oriented Section
This section deals with operational risk management. It addresses the actions to be performed by users immediately before, during, and immediately after a Y2K-related contingency. Examples of this kind of contingency include power outages, system crashes, bad data, loss of communications, etc. A contingency activity might be to make sure backup power could be obtained, and the engineering resources to attach it and allow interrupted operations to continue in a backup mode until the time when primary power could be reconnected.

Additional Considerations
The scope of the plans must be clearly stated, including expected contingency duration, for both kinds of contingencies. Priorities must be carefully defined, established, and agreed to by all parties concerned. Early on, cost estimates to set up and implement the plans should be developed and considered for possible trade-offs. The responsibilities for developing and maintaining each Contingency Plan must be established, as well as the time period between major reviews. Continued Contingency Plan maintenance will be tracked through each organization's validation process.

Remaining Sections
The remaining sections provide details for the preparation of each type of contingency--Programmatic and Mission-Oriented--with Risk Management subsections for the latter, for each of three phases--Planning, Execution, and Recovery--with the last section being Recommendations. Each project will have different analysis factors depending on local and system-specific parameters. Risk Management involves enumerating possible alleviating or aggravating occurrences that affect each possible failure mode, and attempting to provide meaningful weighting of the effects of isolated factors on the total system performance or degradation. Recommendations will be resulting prioritized actions to minimize or control the effects of the most likely negative outcomes.

Finally, all contingency plans should be tested to ensure the systems/functions they support are adequately replaced in the face of a Year 2000 failure.

YEAR 2000 RELATED DATES TO TEST

The following lists of dates must be considered for testing the Year 2000 compliance of systems. If any of these mandatory dates are excluded from testing, a detailed explanation of this exclusion must be clearly documented. The reason for exclusion must be sufficiently described such that an informed reader of the test plan would understand why the date has been excluded.

In addition to the mandatory dates, most systems will require other dates to be tested for Year 2000 compliance. These are not considered mandatory, but must be included in the testing of the particular system. The Year 2000 project office or test manager may request that specific non-mandatory dates be included in any system's test.

CONDITIONS TO CHECK

In Table 1, columns that are selected imply that these conditions must be tested. This chart indicates what testing of each of these conditions implies.

Today - Dates that require testing on the day specified. These are dates, which have been deemed critical by various sources. The system under test must be shown to function correctly on these days. Tomorrow - Dates that require testing of the next day. Tests must be conducted on this date to show that the system knows what day and date tomorrow is.

Yesterday - Dates that require testing of the previous day. Tests must be conducted on this date to show that the system knows what day and date yesterday was.

Roll Over - Dates that require that the roll over from or to this day need to be tested. Failures are likely to occur when the date changes. If the yesterday column is checked, then the roll over from yesterday to today needs to be tested. If the tomorrow column is checked, then the roll over from today to tomorrow needs to be tested. If both are checked, then both rollovers need testing.

Tests must be conducted such that the day is allowed to change while the system is running. For some systems it is also necessary to test the roll over of the following dates with the system powered-off or in an un-initialized state.

Day of Week - If this column lists a day of the week, then tests must be provided that show that the system under test recognizes the given day is this day of the week

TABLE 1: SPECIFIC DATE TESTS

This table lists specific dates that have particular significance as part of millennium testing. These dates are considered the most likely to cause problems with systems that are not millennium compliant. Each system must be tested on each of the dates listed or a detailed explanation must be given as to why testing for the particular date is unnecessary.

This table also includes the required tests for those applications that use a fixed or sliding window approach for assuming the century. The application must successfully handle the transition into the pivot year and the transition from the end of the pivot year to the next year (recognizing the change of the century for '20' to '19'). The application must also test, as a boundary condition, the last leap year prior to the pivot year.

Date
Conditions to Check: Today, Tomorrow, and Yesterday

Roll Over Day of Week - 1999/01/01 First occurrence of '99'. Year '99' has a special meaning in many systems (never expire, error, etc.). Is tomorrow correct? Treasury Board considers this test optional for non-mission critical systems.

1999/08/21
Global Position System Roll over date.
Verify the roll over to August 22, 1999.

1999/09/09
Occurrence of 99/9/9. possible occurrence of 9999. Some applications perform special actions based on dates being set to specific values. These special conditions need to be tested. Some examples of actions that may be triggered based on a date are: never expire, record deletion, etc.

2000/01/01
First occurrence of year 2000 or '00' for two-digit representations.

Sat 2000/02/28
Are leap year rules correct?

2000/02/29
Part of leap year testing. Verify as Julian day 60. Verify as binary date 36584 (where the base date is: January 1, 1900).

Tue 2000/03/01
Part of leap year testing. Verify as Julian day 61.

Wed 2000/12/31
Should be Julian day 366.

Sun 2001/01/01
Start of new year. Should be a Monday. Occurrence of 01/01/01. The date may have special meaning in some systems (never expire, error, etc.).

Mon 2001/03/01
Ensure correct leap year processing. Verify as Julian day 60.

2004/02/28
Are leap year rules correct?

2004/02/29
Part of leap year processing. Verify as Julian day 60.

2004/03/01
Part of leap year processing. Verify as Julian day 61.

(20xx-1)
12-31
Applications that use either a fixed or sliding window. Where 'xx' is the pivot year, the system needs to be tested for the date prior to the start of the pivot year.

20xx-01 -01
Applications that use either a fixed or sliding window. Where 'xx' is the pivot year, the system needs to be tested on the first day of the pivot year.

20xx-12-31
Applications that use either a fixed or sliding window. Where 'xx' is the pivot year, the system needs to be tested at the end of the pivot year. No roll-over test is possible for this condition.

(19xx+1)
01-01
Applications that use either a fixed or sliding window. Where 'xx' is the pivot year, the system needs to be tested to ensure that data with a year of 'xx+1' is recognized with the correct century. No Rollover test is possible for this condition.

20yy-02-28
Applications that use either a fixed or sliding window. Where 'yy' is the last leap year prior to the pivot year. The application must prove, as a boundary test condition, those leap year calculations are performed correctly.

20yy-02-29
Applications that use either a fixed or sliding window. The application must prove, as a boundary test condition, those leap year calculations are performed correctly.

20yy-12-31
For applications that use either a fixed or sliding window. Where 'yy' is the last leap year prior to the pivot year. The application must prove, as a boundary test condition, those leap year calculations are performed correctly and that this is Julian day 366.

TABLE 2: DATE CALCULATION/DATE SENSITIVE ACTION TESTS

Conditions and system functionality that must be considered when testing for year 2000 compliance. These tests ensure that arithmetic computations on dates, date-sensitive actions, calculations of past and future dates, ordering of date information, expiration of accounts, the conversion of dates and times, dates or date formats with special meaning, and any regular processing such as backup, retrieval, monthly processing, etc.

YEAR AHEAD CALCULATIONS
If the system performs calculations for some time in the future, tests are required to ensure that calculations are performed correctly beyond the year 2000. Examples of these systems are those that project or forecast events in the future. Testing on relevant dates in 1999 is mandatory.

YEAR BEHIND CALCULATIONS
If the system performs calculations for some time in the past, tests are required to ensure that the calculations are performed correctly when the system date is beyond the year 2000. Examples of these systems are those that perform archival operations or backup operations. Testing on relevant dates in 2000 is mandatory.

PASSWORD EXPIRATION
Do passwords expire on the correct dates? Across the millennium threshold? After the millennium?

LICENSE EXPIRATION
Do software licenses for COTS/GOTS software expire on the correct dates? Across the millennium threshold? After the millennium?

DATE SORTING
Does the system sort dates properly with some dates beyond the millennium and some dates prior to the millennium? Examples of this are systems that display lists of data for user selection or display.

DATE CONVERSION
If the system performs conversions between Gregorian and Julian dates then tests are required for conversions in both directions.

DATE FORMAT CONVERSION
Are conversions between 6 and 8 digit date representations performed correctly? Are conversions between date formats such as **MM/DD/YY** to **YY/MM/DD** performed correctly?

TIME ZONE CONVERSION
If the system knows time zones, verify operation when Zulu (UTC) time on one date and local time on a different date for each critical roll over date. This must be done for both + and - from Zulu time.

DATE RANGE SELECTION
For systems that display or allow for a range of dates, it is mandatory to test the range crossing the year 2000; that is, from some date prior to the year 2000 to some date in the year 2000. An example of this type of system would be a reporting system that allows the user to select data by specifying a start and end date.

BACKUP AND RESTORE
Do backups occur on correct dates? Can data be restored after the millennium that is backed up prior to the millennium?

CRYPTOGRAPHIC KEYS
For systems that employ cryptographic keys, are the keys operational for the critical dates?

REGULAR PROCESSING
Is there processing that takes place monthly, quarterly, annually? If so, tests are required at the rollover date. For example, if the system is tied to government year end.

SPECIAL MEANING
Some applications perform special actions based on dates being set to specific values. These special conditions need to be tested. Some examples of actions that may be triggered based on a date are: Never expire, record deletion, etc. Some examples are 99/9/9, 11/11/11, 01/01/01, 99/99/99, 9999/99/99, 0000/00/00, etc.

KNOWN ERROR CONDITIONS
Specific error conditions that need to be tested. Systems that receive external data should not expect the data to be clean in terms of dates when the year 2000 arrives. These systems must be able to handle the date problems listed in this table.

MISSING YEAR
In this case, the two-digit year is missing from the date. The recovery option is to add '00' or the current year, whichever is larger. Example: DD/MM/YY is 01/01/ can be changed to 01/01/00. DDHHMMZMMMYY 121431ZJAN can be changed into 131431ZJANOO.

SINGLE DIGIT YEAR
In this case the two-digit year is reduced to one digit. The recovery option is to expand the year to two digits. Example: 01/01/0 can be changed to 01/01/00. 131431ZJANO can be changed to 121431ZJANOO.

THREE DIGIT YEAR
In this case, the Unix time function returns 100 for the year 2000 instead of 00. The recovery option in this case is to remove the first digit of the year. Example: 01 /01/ 100 can be changed to 01/01/00.

WRONG TWO-DIGIT YEAR
In this case, the Unix time function returns 100 for the year 2000 and the first two digits were used in the date field. The recovery option is to rep lace 10 with the current year. Example: 01/01/10 can be changed to 01/01/00. 131431ZJAN 10 can be changed to 131431ZJANOO.

BAD LEAP YEAR DATE
In this case, February 29, 2000 is incorrectly specified as March 0, 2000. The recovery option is to fix the leap year date. Example: (DD/MM/YY) 00/03/00 can be changed to 29/02/00.

SPACE IN YEAR
In this case, the first digit of the year is a space. The recovery option is to replace the space with a 0. Example: 21/05/1 can be changed to 21/05/01.

NON-MANDATORY DATES
Non-mandatory dates are found on various published lists of Year 2000 critical dates. Although not generally considered mandatory, they should be considered when determining the tests for millennium compliance. Any dates that apply to the system must be included in the tests. A rationale for any of those dates not included is strongly recommended (particularly if the reason is not clear) although not required.

1900-01-01
Possible default date for 1999-12-31 roll over. Should be a Monday.

1998-01-01
Test for '98' as a special condition. Date has passed, is this necessary?

1998-12-31
Last day of 1998. Test for roll over to 1999-0 1 -01 considered mandatory, but date itself does not require testing.

2000-01-10
First date after January 1, 2000 that requires two digits for the day. Important on reports and interfaces for spacing and display.

1999-02-27
Test of normal leap year processing. Roll over test is suggested by some sources.

1999-02-28
Test of normal leap year processing. Roll over test is suggested by some sources.

1999-02-29
Test of normal leap year processing. Test should indicate "invalid date".

1999-03-01
End of normal leap year processing testing.

1999-04-09
Day 99 on Julian calendar. Possible occurrence of 9999. Recommended test if system uses Julian dates.

1999-04-20
255 days prior to the year 2000. The test of this date is important for any systems that use a single byte data counter.

1999-07-01
US government start of fiscal year for 48 states.

1999-08-31
First time 99/9/xx is encountered. Obscure test.

1999-09-08
Roll over to 99/9/9 suggested as possible source of error.

1999-09-23
99 days before the year 2000. Obscure at best.

1999-10-01
First day of government fiscal year. Not generally applicable to Canada.

2000-01-03
First business day of Year 2000 in some countries. Should be a holiday in Canada.

2000-01-04
First business day of Year 2000 in Canada.

2000-01-31
End of first month in Year 2000. Roll over test suggested. Could be application specific, particularly for those applications that perform start of end of month processing.

2000-02-01
See previous.

2000-02-30
Should be invalid. Could be made part of leap year testing. Does the System Under Test handle receiving invalid dates?

2000-03-31
End of first quarter of year 2000. Could be application specific, particularly for those applications that perform end of quarter processing.

2000-04-08
Julian day 99. Roll over test to Julian day 100 (April 9, 2000) suggested for systems that perform calculations with Julian dates. First Julian date after January 1, 2000 to require 3 digits.

2000-04-30
First month ending on a weekend. Obscure at best.

2000-10-01
First date after January 1, 2000 that requires two digits for the month. Important on reports and interfaces for spacing and display.

2000-10-10
First date after January 1, 2000 that requires two digits for both the day and the month. Important on reports and interfaces for spacing and display.

2001-09-08
Unix 999,999,999 seconds. Should test on all Unix platforms.

2001-12-31
Check that 2001 has 365 days.

2004-02-20
Normal leap year processing. Date should be invalid.

2004-12-31
Leap year processing. Check that 2004 has 366 days.

2022-12-22
For most fonts the widest day possible before end-of-time.

2038-01-19
Unix crash. End-of-time. Not a year 2000 related problem. Really only needs to be tested on systems that perform long range forecasting.

Appendix E: Exposure Rates for Selected Sources

The following sections present dose rate information for specified sources at 100 cm from the source.

Americium-241

$\Gamma = 8.479 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 172 Shleien]

Note that the progeny of Am-241 is Np-237 ($T_{1/2} = 2.1 \times 10^{6}$ y). In the above dose rate factor, progeny are ignored.

Based upon a simple model, after one half-life the contribution by progeny contribute less than one tenth of one percent to the dose rate factor.

Ba-133

$\Gamma = 1.231 \times 10^{-4}$ mSv h^{-1} MBq^{-1} [Reference: P. 170 Shleien]

Ba-133 decays to stable.

Cd-109

$\Gamma = 4.983 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 169 Shleien]

Cd-109 decays to Ag-109m ($T_{1/2} = 39.6$ s). Assume equilibrium.

For Ag-109m, $\Gamma = 4.466 \times 10^{-4}$ mSv h^{-1} MBq^{-1}. (Ag-109m decays to stable).

Dose conversion factor for Cd-109 in equilibrium with Ag-109m is the sum of the dose conversion factors. Therefore, $\Gamma = 4.964 \times 10^{-4}$ mSv h^{-1} MBq^{-1}.

Cf-252

$\Gamma = 1.131 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 172 Shleien]

Cf-252 decays to Cm-248 ($T_{1/2} = 2.1 \times 10^{6}$ y). In the above dose rate factor, progeny are ignored. Also, spontaneous fission is ignored.

It is estimated that the dose conversion factor, including neutrons and gamma radiation due to spontaneous fission, is approximately 0.126 mSv h^{-1} MBq^{-1}. [Reference: P. 9 Stoddard and Hootman]

Co-57

$\Gamma = 4.087 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 167 Shleien]

Co-57 decays to stable.

Co-60

$\Gamma = 3.703 \times 10^{-4}$ mSv h^{-1} MBq^{-1} [Reference: P. 167 Shleien]

Co-60 decays to stable.

Cr-51

$\Gamma = 6.320 \times 10^{-6}$ mSv h^{-1} MBq^{-1} [Reference: P. 167 Shleien]

Cr-51 decays to stable.

Cs-137

Cs-137 is a pure beta-emitter. It decays to Ba-137m which decays to stable.

For Cs-137: $\Gamma = 2.14 \times 10^{-3}$ mGy h^{-1} MBq^{-1} [Reference: P. 540 Shleien]
For Ba-137m: $\Gamma = 1.032 \times 10^{-4}$ mSv h^{-1} MBq^{-1} [Reference: P. 167 Shleien]

Assuming a quality factor of unity, the dose rate factors can be summed:

$\Gamma = 2.24 \times 10^{-3}$ mSv h^{-1} MBq^{-1}

Fe-55

No dose rate conversion factor was found. However, the following information is available:

Electrons:	**E_{max} (keV)**	**Probability**
	0.61	1.39
	5.2	0.61
Photons:	**Energy (keV)**	**Probability**
	0.64	0.004
	5.9	.08
	5.9	.16
	6.5	.03

The range in air for a 5.2 keV electron is less than one centimetre. Therefore, there will be no electrons at a range of one metre.

To estimate the effect of the low energy photons, a 1 MBq source of an isotope emitting 15 keV photons was modeled (photons with an energy of less than 15 keV cannot be accurately modeled with MicroShield). The following dose rate factor was estimated:

$\Gamma \approx 9 \times 10^{-5}$ mSv h^{-1} MBq^{-1}

The cumulative probability of Fe-55 emitting a photon is 0.27. Therefore, for Fe-55, the dose rate conversion factor is the above factor multiplied by 0.27:

$\Gamma < \approx 2 \times 10^{-5}$ mSv h^{-1} MBq^{-1}

Note that the effects due to bremsstrahlung have been ignored. Also, for low energy photons, such effects as shielding due to air have been ignored.

H-3

Tritium is a pure beta emitter with the following properties:

E_{max} = 18.6 keV
E_{av} = 5.7 keV

The range of these electrons in air is « 1 m. Therefore, the dose rate at one metre is assumed to be zero.

Ir-192

Ir-192 emits both beta and gamma radiation. The progeny, Pt-192, is stable.

For beta: $\Gamma = 1.36 \times 10^{-3}$ mGy h^{-1} MBq^{-1} [Reference: P. 541 Shleien]
For gamma: $\Gamma = 1.599 \times 10^{-4}$ mSv h^{-1} MBq^{-1} [Reference: P. 170 Shleien]

Assuming a quality factor of unity, the dose rate factors can be summed:

$\Gamma = 1.52 \times 10^{-3}$ mSv h^{-1} MBq^{-1}

Kr-85

Kr-85 emits both beta and gamma radiation. The progeny, Rb-85, is stable.

For beta: $\Gamma = 3.53 \times 10^{-3}$ mGy h^{-1} MBq^{-1} [Reference: P. 541 Shleien]
For gamma: $\Gamma = 4.232 \times 10^{-7}$ mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien]

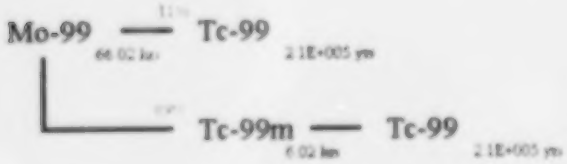
Assuming a quality factor of unity, the dose rate factors can be summed:

$\Gamma = 3.53 \times 10^{-3}$ mSv h^{-1} MBq^{-1}

Since Kr-85 is a gas, there will always be some shielding provided (unless the gas escapes). This shielding has been ignored.

Mo-99

The Mo-99 decay scheme is as follows:



All the above isotopes emit photons and electrons.

For photons, the following dose rate factors are available:

Mo-99: $\Gamma = 3.052 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien]

Tc-99m: $\Gamma = 3.317 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien]
Tc-99: $\Gamma = 1.242 \times 10^{-10}$ mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien]

Due to the relatively short half-lives of the isotopes involved, the dose rate factor is strongly time dependent

The only published electron information is for Mo-99:

electron: $\Gamma = 6.30 \times 10^{-3}$ mGy h^{-1} MBq^{-1} [Reference: P. 538 Shleien]

The electrons emitted by Mo-99 progeny are less energetic than the electrons emitted by Mo-99. Their contribution is considered small.

Therefore, the dose rate factor for Mo-99 will be the sum of the photon and electron dose rate factors (assuming a quality factor of unity):

$\Gamma \approx 6.30 \times 10^{-3}$ mSv h^{-1} MBq^{-1}

Ni-63

Ni-63 is a pure beta emitter which decays to Cu-63, which is stable. with the following properties:

$E_{max} = 66$ keV
$E_{av} = 17$ keV

The range of these electrons in air is « 1 m. Therefore, the dose rate at one metre is assumed to be zero.

Pa-234

Pa-234 is a beta emitter which decays to U-234.

The half-life of Pa-234 is relatively short (6.7 hours). The half-life of U-234 is long (2.4×10^5 y). Therefore, after the Pa-234 has decayed, only U-234 is present.

The dose rate factor for Pa-234 is not published.

For U-234, $\Gamma = 1.242 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 171 Shleien]

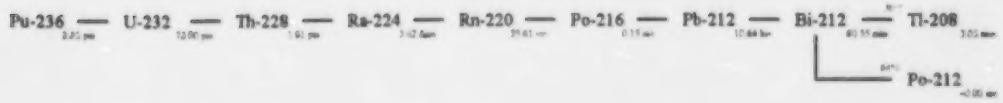
Pu-236

Pu-236 ($T_{1/2}$=2.85 y) is an alpha emitter which decays to U-232 ($T_{1/2}$=72 y).

The range of alphas in air is « 1 m.

For Pu-236, $\Gamma = 2.405 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 172 Shleien]

The progeny of U-232 (there are eight radioisotopes) are all relatively short-lived (all half-lives are less than a few days). Therefore, as Pu-236 decays, all isotopes in the decay chain will (within weeks) be in equilibrium. The decay chain is as follows:



The gamma dose rate factors for the decay chain are as follows [Reference: P. 171-172 Shleien]:

Radioisotope	Dose Rate Factor (Γ) mSv h^{-1} MBq^{-1}
U-232	2.403×10^{-5}
Th-228	2.142×10^{-5}
Ra-224	2.967×10^{-6}
Rn-220	9.723×10^{-8}
Po-216	2.424×10^{-9}
Pb-212	7.389×10^{-5}
Bi-212	5.264×10^{-5}
Tl-208	4.605×10^{-4}
Po-212	Not available.

For the above decay chain, there are three beta-emitters: Pb-212, Bi-212 and Tl-208. Electron dose rate information is only available [Shleien] for Tl-208 and Pb-212:

For Tl-208, $\Gamma = 8.0 \times 10^{-3}$ mGy h^{-1} MBq^{-1} [Cross et al]
For Pb-212, $\Gamma = 1.00 \times 10^{-4}$ mGy h^{-1} MBq^{-1} [Reference: P. 542 Shleien]

A dose rate factor can be calculated by summing the dose rate factors and using the following assumptions:

utilizing the fraction (0.36) of Bi-212 that decays to Tl-208;
ignoring any possible radon off-gassing;
ignoring the contribution of beta-emitters for which data are not available
assuming a quality factor of unity; and
ignoring bremsstrahlung;

The result is $\Gamma = 8.2 \times 10^{-3}$ mSv h^{-1} MBq^{-1}.

Pu-239

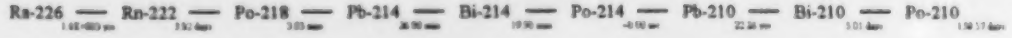
Pu-239 ($T_{1/2}$=2.4 x 10^4 y) is an alpha emitter which decays to U-235($T_{1/2}$=7.0 x 10^8 y). Pu-234 is an alpha emitter with some electrons and weak gammas.

Ignoring progeny, the dose rate factor for Pu-239 is:

$\Gamma = 8.145 \times 10^{-6}$ mSv h^{-1} MBq^{-1}.

Ra-226

Ra-226 is part of the natural uranium series (4n + 2) decay chain. The decay chain is as follows:



The dose rate factor for Ra-226, in equilibrium with all progeny, is 2.2 x 10^{-4} mSv h^{-1} MBq^{-1}. This is based upon a 30% off-gassing fraction of Rn-222 ($T_{1/2}$ = 3.82 days).

The dose rate factors are presented in the following table:

Radioisotope	**Dose Rate Factor (Γ) mSv h^{-1} MBq^{-1}**
Ra-226	3.274 x 10^{-6}
Rn-222	7.390 x 10^{-8}
Po-218	Not available.
Pb-214	8.742 x 10^{-5}
Bi-214	2.268 x 10^{-4}
Po-214	1.398 x 10^{-8}
Pb-210	6.801 x 10^{-5}
Bi-210	Not available.
Po-210	1.24 x 10^{-9}

The sum of the above is 3.856 x 10^{-4} mSv h^{-1} MBq^{-1}.

Based upon a MicroShield model, a dose rate factor of 2.4 x 10^{-4} mSv h^{-1} MBq^{-1} was calculated.

For the electrons, data are only available for Pb-210 and Bi-210. The Pb-210 electrons have a range in air of much less than one metre. For Bi-210, the dose rate factor at one metre is 4.71 x 10^{-3} mGy h^{-1} MBq^{-1}.

The electron dose rate is approximately an order of magnitude greater than the photon dose rate factor. A dose rate facto can be calculated by summing the dose rate factors and using the following assumptions:

ignoring any possible radon off-gassing;
ignoring the contribution of beta-emitters for which data are not available
assuming a quality factor of unity; and
ignoring bremsstrahlung.

The sum of the photon and electron dose rate factors is 5.10 x 10^{-3} mGy h^{-1} MBq^{-1}.

Sr-90

Sr-90 ($T_{1/2}$=28.6 y) is a pure beta emitter which decays to Y-90 ($T_{1/2}$=64.1 h). Y-90 is also a pure beta emitter. These two isotopes are assumed to be in equilibrium.

The dose rate factors for these isotopes are as follows:

For Sr-90: $\Gamma = 1.11 \times 10^{-3}$ mGy h^{-1} MBq^{-1}
For Y-90: $\Gamma = 8.56 \times 10^{-3}$ mGy h^{-1} MBq^{-1} [Reference: P. 542 Shleien]

A dose rate factor can be calculated by summing the dose rate factors and using the following assumptions:

assuming a quality factor of unity; and
ignoring bremsstrahlung;

Therefore, for Sr-90/Y-90, $\Gamma = 9.67 \times 10^{-3}$ mSv h^{-1} MBq^{-1}.

Tc-99m

Tc-99m is part of the Mo-99 decay scheme, as described in Section 13.

Tc-99m ($T_{1/2}$=6.02 h) decays to Tc-99 ($T_{1/2}$=2.1 x 10^5 y). The following information is available:

Tc-99m: $\Gamma = 3.317 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien]
Tc-99: $\Gamma = 1.242 \times 10^{-10}$ mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien]

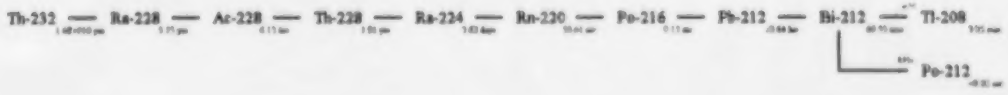
Beta dose factors are not published. However, for the maximum energy beta particles (E_{max} = 293 keV), the range is not more than one metre. Therefore, the beta dose is considered negligible.

The sum of the photon dose rate factors is:

$\Gamma = 3.317 \times 10^{-5}$ mSv h^{-1} MBq^{-1}.

Th-228

Th-228 is part of the natural thorium (Th-232) decay chain. Th-228 is also part of the Pu-236 decay scheme, as presented in Section 16. The Th-232 decay chain is as follows:



Based upon a MicroShield model, with all progeny in equilibrium, the dose rate factor is approximately 2.4 x 10^{-4} mSv h^{-1} MBq^{-1}.

In the decay chain there are three beta-emitting isotopes: Pb-212, Bi-212 and Tl-208. As shown in Section 16, the dose rate factor for these isotopes is:

$\Gamma = 8.2 \times 10^{-3}$ mSv h^{-1} MBq^{-1}.

The sum of the gamma and beta dose rate factors yields:

For Th-228: $\Gamma = 8.4 \times 10^{-3}$ mSv h^{-1} MBq^{-1}.

Th-230

Th-230 is part of the natural uranium (U-238) decay chain. Th-230 ($T_{1/2}$=7.7 x 10^4 y) decays to Ra-226. The decay chain for Ra-226 was presented in Section 18.

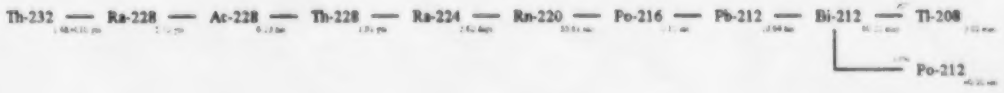
Th-230 has a dose conversion factor of 1.861×10^{-5} mSv h^{-1} MBq^{-1} [Reference: P. 168 Shleien].

If Th-230 is in equilibrium with Ra-226, the dose conversion factor for Ra-226 (5.10×10^{-3} mGy h^{-1} MBq^{-1}) should be added, yielding:

For Th-230: $\Gamma = 5.12 \times 10^{-3}$ mGy h^{-1} MBq^{-1}.

Th-232

Th-232 is natural thorium. The decay scheme is as follows:



Th-228, which is in the above decay chain, was discussed in Section 21. This section will address Th-232 to Ac-228 inclusive.

Ra-228 is a pure beta-emitting isotope (E_{max} = 38.9 keV). The range of this particle, in air, is much less than one metre.

For Th-232 and Ac-228, the following dose rate factors are available:

Th-232: $\Gamma = 1.848 \times 10^{-5}$ mSv h^{-1} MBq^{-1} [Reference: P. 171 Shleien]
Ac-228: $\Gamma = 2.281 \times 10^{-4}$ mSv h^{-1} MBq^{-1} [Reference: P. 171 Shleien]

The sum of the photon dose rate factors is:

$\Gamma = 2.466 \times 10^{-4}$ mSv h^{-1} MBq^{-1}.

For Th-228, including progeny (Section 21) the dose rate factor is:

$\Gamma = 8.4 \times 10^{-3}$ mSv h^{-1} MBq^{-1}.

Therefore, for Th-230, For Th-228, $\Gamma = 8.6 \times 10^{-3}$ mSv h^{-1} MBq^{-1}.

Summary

	Isotope	Dose Rate at 1 m ($mSv\ h^{-1}\ MBq^{-1}$)
1	Am-241	8.479×10^{-5}
2	Ba-133	1.231×10^{-4}
3	Cd-109	4.964×10^{-4}
4	Cf-252	0.126
5	Co-57	4.087×10^{-5}
6	Co-60	3.703×10^{-4}
7	Cr-51	6.320×10^{-6}
8	Cs-137	2.24×10^{-3}
9	Fe-55	2×10^{-5}
10	H-3	0
11	Ir-192	1.52×10^{-3}
12	Kr-85	3.53×10^{-3}
13	Mo-99	6.30×10^{-3}
14	Ni-63	0
15	Pa-234	1.242×10^{-5}
16	Pu-236	8.2×10^{-3}
17	Pu-239	8.145×10^{-6}
18	Ra-226	5.10×10^{-3}
19	Sr-90	9.67×10^{-3}
20	Tc-99m	3.317×10^{-5}
21	Th-228	8.4×10^{-3}
22	Th-230	5.12×10^{-3}
23	Th-232	8.6×10^{-3}

References

Shleien, B "The Health Physics and Radiological Health Handbook" Revised Edition, Scinta, Inc, 1992.

Stoddard DH and HE Hootman "^{252}Cf Shielding Guide" Savannah River Laboratory report DP-1246 March 1971.

Cross, WG et al "Tables of Beta-Ray Dose Distributions in Water, Air and Other Media" AECL-7617, September 1982.

"MicroShield" Version 4, Grove Engineering, 1992.

Appendix F: Vendor Compliance Statements as Available on the Internet

J.L. Shepherd
Bicron
Varian
Siemens
Theratronics
Nordion
Nucletron
Elekta (formerly Philips)
Ohmart
Ronan

US FDA Y2K Biomedical Equipment Clearinghouse Data

JL SHEPHERD & ASSOCIATES
1010 ARROYO AVE., SAN FERNANDO, CALIFORNIA 91340-1822
818-898-2361 FAX 818-361-8095

March 12, 1999

Len Gaulois
Y2K Project Manager
SAIC Canada

Fax: 613-563-2251 6 Pages

Dear Mr. Gaulois:

All the Irradiators and Calibrators (which we manufacture), including the Model 81-14, 142-10, 124-5, 89, 81-12, 81-10 and 28-5, do not have any date dependent internal components or microprocessors, including the timers. Timers indicate hours, minutes and seconds and do not have an internal clock. Typically we use Kessler Ellis and Red Lion timers, which are not date/time sensitive, certifications attached.

Some Irradiators and Calibrators may have a JLS&A installed RS-232 interface as an accessory, which does not run the device. The old interfaces (pre-1999) are not Y2K compliant (2 digit dates on the E prom), an upgrade (which is now available) is Y2K compliant. We will not guarantee that any customer or after market installed computer interfaces or hardware are Y2K compliant. The customer is responsible for making those determinations and upgrades.

JLS&A's internal Y2K upgrades have been completed on 11/30/98. These consist of upgrading our accounting program and Novelle Network and a new business telephone system. Work stations have been upgraded and we have obtained certifications from the manufacturers. Our testing, which consists of changing the date to 1/1/2000 (and further), has not shown any non-compliance; however we will not guarantee that problems will not occur with the date change. Please note that JLS&A can function completely without computers - we still maintain manual systems. Our computers do not directly impact manufacturing, quality assurance or service areas. Additionally, we can not and will not guarantee that business disruptions will not occur due to infrastructure (communications, transportation, power, etc.) non-compliance or to government agency, banking or supplier non-compliance, either nationally or internationally. In regards to the possibility infrastructure breakdowns or disruptions, we have no idea on how any business will avoid disruptions of business relationships and cannot plan contingency infrastructure substitutions.

In regards to suppliers, we maintain alternate suppliers for spare parts and keep most non-special order parts in inventory. Currently, all of our suppliers, large, medium and small businesses, as well as regulatory agencies, are still evaluating their Y2K readiness programs and as they will not yet commit to full Y2K compliance, we cannot make this commitment for them.

If we can be of additional assistance, please let us know.

Sincerely yours,

J.L. SHEPHERD AND ASSOCIATES

Mary F. Shepherd

Mary F. Shepherd
Vice President

March 12/99
Marla.

cc R Piaua

INDICATION AND CONTROLS

RED LION CONTROLS
20 Willow Springs Circle, York, PA 17402
Sales / Service (717) 767-6511
Fax (717) 764-0839
[E-mail] sales@redlion-controls.com
[Web site] http://www.redlion-controls.com

December 18,1998

Diana Shepard
JL Shepard & Assoc.
1010 Arroyo Ave.
San Fernado, CA 91340
FAX: 818-361-8095
Phone:

Ms. Shepard:

In reference to the Year 2000 compliance, all Red Lion Controls products with the exception of the APLCK, ADI, MDI, MDS, MDPI, MDPS, PBLCK, and P802 Operator Interface Terminals, are non date/time sensitive and are considered compliant by default.

The APLCK (Apollo Clock) and the PBLCK (Apollo Clock Personality Board) do not have parallel or serial communications for system integration. Even though compliance is not a concern, the APLCK and the PBLCK were tested and will perform to specifications without modification into and beyond the year 2000 including the leap year 2000.

The ADI (Alphanumeric Display Intelligent Unit), MDI (Message Display Intelligent Unit), MDS (Message Display Slave Unit), MDPI (Message Display Personality Intelligent Unit) and the MDPS (Message Display Personality Slave Unit) utilize date/clock formatting. These units have been tested and will perform to specifications without modifications into and beyond the year 2000. These units also recognize the leap year 2000.

The P802 (Operator Interface Terminals) as the units above have been tested and will perform into and beyond the year 2000 without modifications. Including the leap year 2000.

The following page contains the list of full part numbers concerning date/time formatting of the previously discussed units. All other Red Lion Control products,

Including products with serial communications, do not incorporate date/time formatting thus are compliant by default.

Any questions may be directed to Steve Grove.
Voice: (717) 767-6511 ext: 6617
Fax: (717) 764-0839
Email: steveg@redlion-controls.com

Sincerely,

Stephen A Grove (CH)

Stephen A. Grove
Technical Sales Supervisor

Product numbers of units with date/time formatting tested into and beyond the year 2000 without any modifications required.

ADI2R11A
ADI2R11D
ADI4Y11A
ADI4Y11D
ADI4T11A
ADI4T11D

APLCK000
APLCK010

MCI1R01A
MCI1R01D
MCI1R11A
MCI1R11D
MCI1Y01A
MCI1Y01D
MCI1Y11A
MCI1Y11D
MCI2R01A
MCI2R01D
MCI2R11A
MCI2R11D
MCI2Y01A
MCI2Y01D
MCI2Y11A
MCI2Y11D
MCI3Y01A
MCI3Y01D
MCI3Y11A
MCI3Y11D
MCI4Y01A
MCI4Y01D
MCI4Y11A
MCI4Y11D

MCPI1000
MCPS0000

MCS1R01A
MCS1R01D
MCS1Y01A
MCS1Y01D
MCS2R00A
MCS2R00D
MCS2Y00A
MCS2Y00D
MCS3Y01A
MCS3Y01D
MCS4Y00A
MCS4Y00D

MDI1R11A
MDI1R11D
MDI1Y11A
MDI1Y11D
MDI2R11A
MDI2R11D
MDI2T11A
MDI2T11D
MDI2Y11A
MDI2Y11D
MDI3Y11A
MDI3Y11D
MDI4Y11A
MDI4Y11D

MDPI1000
MDPS0000

MDS1R01A
MDS1R01D
MDS1Y01A
MDS1Y01D
MDS2R00A
MDS2R00D
MDS2Y00A
MDS2Y00D
MDS3Y01A
MDS3Y01D
MDS4Y00A
MDS4Y00D

PBLCK000

P802102B
P802103B
P802104B
P802105B
P802106B
P802107B
P802108B

KESSLER-ELLIS PRODUCTS

Counters/Timers/Ratemeters
Flow Instruments
PLC Peripherals • MMI Software

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Visit Our Web Site At www.kep.com

July 10, 1998

YEAR 2000 READINESS DISCLOSURE

MANUFACTURING PROCESS AND BUSINESS SYSTEMS

To Whom It May Concern:

Kessler Ellis Products is a responsible organization, with full awareness of the potential havoc the Year 2000 could bring. We are fully aware of the importance of taking the necessary steps to ensure that our systems will continue to conduct business in an uninterrupted manner after the advent of the Year 2000.

We have evaluated our manufacturing process and business systems in order to understand the impact of the Year 2000 date changeover.
We have evaluated all of our PC and server based office automation and are currently in the process of hardware and software upgrades to ensure a smooth transition to January 1, 2000.
We have evaluated the impact of external suppliers and providers and taken necessary action to ensure that they will continue to provide uninterrupted services to our organization.

Our Year 2000 Compliance Plan anticipates total compliance with Year 2000 requirements by March 31, 1999. During the months of April and May all internal systems will undergo testing to verify their stability and integrity with the emphasis on verification that:
1. Programs can tell the difference between years in different centuries that end in the same two digits;
2. That data on or after January 1, 2000 will be processed; and,
3. That the Year 2000 will be recognized as a leap year.

KEP has received an overwhelming number of inquiries regarding Y2K compliance of our products and systems. These inquiries, especially those which require the completion of customized survey forms, consume excessive amounts of corporate time. Therefore, the corporation has adopted the official policy that customized survey forms will no longer be completed. This disclosure is our official statement regarding the Y2K compliance of our manufacturing process and business systems.

Nira Kay Nevins
Quality Assurance Manager

Rev C: 02/02/99

KESSLER-ELLIS PRODUCTS

Counters/Timers/Ratemeters
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Visit Our Web Site At www.kep.com

03 December 1997

YEAR 2000 READINESS DISCLOSURE

Y2K TEST PROCEDURE

To Whom It May Concern:

Kessler Ellis Products has successfully tested our range of products with internal time/date capabilities for Year 2000 compliance.

The test procedure was performed as follows:

1) Set the unit's date and time to 12/31/99, 23:58:00
2) Remove power from those units which have real time capabilities after power down
3) Wait 3 or 4 minutes and power the unit under test back up
4) Verify that the date reads 01/01/00
5) For units that maintain time of power down but do not continue to time after power down, set the unit's date and time to 12/31/99, 23:59:00.
6) As the time changes from 23:59:59 to 00:00:00 verify that the date changes to 01/01/00.
7) For all units verify that the unit recognizes the year 2000 as a leap year.

Please be advised that this disclosure applies to our hardware and software only. You are encouraged to validate the Year 2000 compliance of any accompanying systems, especially if the real time clock is used for functions in your application.

Nira Kay Nevins
Quality Assurance Manager

Rev A: 02/02/99

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RECEIVED
FEB 19 1999

03 December 1997

YEAR 2000 READINESS DISCLOSURE

PRODUCT COMPLIANCE

To Whom It May Concern:

Kessler-Ellis Products has successfully tested our microprocessor based products having internal time capabilities for the Year 2000 compliance requirement. The following products comply:

SUPERtrol I (ST1)	SUPERtrol II (ST2)	LEVELtrol II (LT2)	MASStrol (MFC)
DPFC	MMI-2000	ZOID Series	SHM Clock

We are pleased to reassure you that all software versions of these products are fully compliant with the requirements for the Year 2000 rollover and the recognition of that year as a leap year.

The following products have no date/time/real time clock capabilities and, therefore, present no Year 2000 compliance issues:

INT69	BatR/T, BatD/T, BatRAT	Squirt, Squirt-R
KEPtrol R/T (KRT8)	FLOWtrol (FLO8)	KEPtrol F/C (KFC8)
MASSBATCH (MB8)	KEPtrol (KP8)	BATCHtrol (BT8)
BATCHtrol II (BT28)	LEVELtrol (LTR8)	XL-10
OMNI	8000 Series	SHIFT-TROL (ST)
Positrol (PM2)	SCPS	Protrol (PR)
INT61, 62, 64, 65	KP/C	S12
MMI-100, 110, 200, 210, 220, 240		PC_9
Flare	ATM-20	Reporter
IMC & IMC2	PPRJR	MiniBatcher (MB2)
Minitrol (MRT, MC2, MT2, MR, MC)		Minitrol-S (MRTS)
Minitrol-PW (MRT2W)		DRT Series

Brian Walter
Brian Walter
PLC Product Manager

Richard Gruskos
Richard Gruskos
Flow Product Manager

Nira Kay Nevins
Nira Kay Nevins
Quality Assurance Manager

Rev D: 02/02/99

Bicron • NE
6801 Cochran Road
Solon, Ohio 44139

Fax: 440-349-6581
Phone: 440-248-7400

Fax

To: Atomic Energy Board, Canada
From: Gail Marlowe
Attn: Hisham Cheikali
Pages: 5
Fax #: 613-563-2251
Date: 03/12/99
Re: Year 2000 Compliance
CC:

Dear Mr. Cheikali:

Subject: Year 2000 Compliance Inquiry about Model No. 8800 Category No. 4

Thank you for your request for information about the Y2K compliance of the above instrument(s). For your reference we have attached a copy of our Publication No. 2000-0-N-1098-002, dated October 30, 1998. This lists all the current instruments manufactured by Bicron and, as you can see by the above reference, your instrument category is listed. Please refer to page 1 of the document for the complete description of your category.

If you require additional information regarding this matter, or any other Bicron products, please feel free to contact us at your earliest convenience.

Gail Marlowe

P.S. Please note we are still checking on the 6610C and will advise you as soon as we have a determination.

- - 482

Mar 15/99
Nadia

BICRON
RADIATION MEASUREMENT PRODUCTS

BICRON◆NE
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All BICRON◆NE Products

Technical Notice
Year 2000 Compliance

Publication No. 2000-0-N-1098-002

* * * Release Date * * *

October 30, 1998

Part No. M-26737
Rev. A

Publication Number: 2000-0-N-1098-002
Part No. M-26737, Rev. A

Replaces and supercedes: 2000-0-N-0798-001

TECHNICAL NOTICE

The purpose of a Technical Notice is to quickly inform users of BICRON♦NE products of a change in a product, a solution for a technical problem, or to provide an answer to a commonly asked question about a product. A Technical Notice is written with minimal introductory material on the assumption that the user already is familiar with the product and has access to any instruction manuals supplied with the unit. In most cases the information in a Technical Notice will be incorporated in a subsequent release of a user's manual. Technical Notices should be filed with user's manual for future reference.

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Printed in U.S.A.

2000-0-N-1098

Year 2000 Compliance

In preparation for the year 2000, we have completed a preliminary review of all BICRON◆NE products to evaluate readiness for the year 2000. We have defined four categories of compliance and located every product within one of those four categories according to our best knowledge at this time. The categories are as follows:

1. Products that operate without a real time clock and do not store or calculate date and time data. Year 2000 compliance is not an issue for these products.

2. Products that incorporate a real time clock that is used for date stamping but performs no calculations related to time and date. Year 2000 compliance is not an issue for these products.

3. Products that incorporate a real time clock that is used for time-based calculations, such as elapsed time calculation. The software and firmware used in these products has been evaluated and we believe it to be year 2000 compliant.

4. Products that incorporate a real time clock that is used for time-based calculations, such as elapsed time calculation. The soft/firmware used in these products has been evaluated and requires some modification to be year 2000 compliant.

Tables 1 through 3 identify all BICRON◆NE products by category.

For additional questions, please contact any of the following:

Mr. Joe Bellian 1 800 892 8707
Solon, Ohio, USA

Mr. Manfred Majewski +49 (0) 21 96 78 22 0
Wermelskirchen, Germany

Mr. Garry McCann +44 (0)118 971 2121
Reading, England

Table 1 Harshaw TLD Products

Product	Models	Software Ver.	Cat.	Notes
TLD Readers	2000 series, 3000, 3000A, 3500, 4500, 5500	NA	1	
TLD Readers	4000, 4400	NA	4	No upgrade path
TLD Reader	6600	S-24268.011	4	Internal firmware needs to be upgraded. Goal is to have an upgrade by 12/98
TLD Reader	8800	S-23563.007	4	alternative is to upgrade to 8800PC
TLD Reader	8800PC	S-26469.001	3	
TLDShell	applies to 3500, 5500	PL-25286.005	3	
TLD-REMS, NET-REMS	applies to 4500, 6600, 8800	PL-23688.021 PL-25415.004	3	
Algorithms	DOELAP NVLAP3 NVLAP Environmental	PL-24331.009 PL-24814.001 PL-25932.005 PL-24767.005	3	
Algorithms	BGN-NVLAP BG-NVLAP BGN-DOELAP EXTRAD	PL-25396.001 PL-25440.001 PL-25485.001 PL-25365.004	4	DOS version needs to be upgraded. Goal is to have an upgrade 12/98.
Software	CGCD GCA	PL-23460.003 PL-25525.001	4	DOS version needs to be upgraded. Goal is to have an upgrade 12/98
Software	HPRS	various	3,4	Varies with application and installation. Generic version is available in Windows and is Year 2000 compliant.

Table 2 BICRON Products

Product	Models	Software Ver.	Cat.	Notes
Early Automated Scrap Monitoring Systems	ASM Series D, E, V	25952.001	4	Controller upgrade is required
Early Auto. Scrap Mon'g. Systems, Landfill Monitors, Radioactive Waste Mon'g Systems	ASM-6, ASM-200, LFM-1, LFM-2, RWS-2, RWS-4	N/A	1	
Automated Scrap Mon'g Systems	ASM E/II	26086.002	3	software ver. .002 and later
Automated Scrap Mon'g Systems	ASM III	2.03	3	
Laundry and Contamination Monitoring Systems	ACM-96 ACM-120 MCM	1069000 1069001 1069002	2 4 4	*update plans???*
Count/Dose Rate Meters	Radiographer, Surveyors, Tech 60, Analyst, Micro Analyst	N/A	1	
Dose Equivalent Rate Meters	Micro-Rem/Selvert	N/A	1	all variations
Ion Chamber Meters	RSO	N/A	1	all variations
Benchtop Systems	Labtech, Frisktech	N/A	1	
Networked Remote Monitoring Systems	All	N/A	2	

Table 3 NE Products

Product	Models	Category	Notes
Scaler Ratemeters	SR7, SR8, ST7	1	
Ratemeters	Electra, Selectra, Delta3, Delta5, NM2B, PAM2, PAM3, PCM5, PDM1A, PDM1B, PRM510, PRM300, PDR1A, PDR2, PDR3, PDR4, RM5, RM6	1	
Ratemeters	Electra Plus, Selectra Plus	2	
Wall Monitors	CM7, CM9, CM11, IBEX, SHM4A, NE8470	1	
Hand Monitors	HM7, HM9	1	
Hand & Foot Monitors	HFM7A, HFM9A, WEM1	1	
Gamma Alarms	GA2, GA3, GI4, GA4	1	including all variations
Radiological	2570A, 2670A, 2620A, 2630A	1	
Gamma Portal Monitors	SPM904, SPM906, TPM703	1	Made by TSA
Active Waste Monitors	AWM1A, AWM1B	2	
Small Article Monitor	SAM9, SAM11	2	Including all variations
Installed Personnel Monitors	IPM7, IPM8, IPM9	2	Includes variations A, C, & D
Waste Sorting Table	MS0223	2	
TLD Readers	Solaro, Rialto, 813*, 823*, 2590A, 2590B, Toledo	3	* without management software
TED Reader	Autoscan	4	

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Year 2000 Information: Clinac EX

FDA Registration #2916710

Clinac EX (All Models)

Clinac Model:	Clinac 6EX, 21EX or 23EX
Computer Platform:	Dell Optiplex GXa, GXi and GX1 with MS-DOS 6.22.
Varian Software Releases:	5.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	Yes
Description of Compliance Problems:	None
Solution/Workaround:	N/A
FDA Code:	N/A
Date of Expected Solution:	N/A

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Last revised November 10, 1998.

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Year 2000 Information: Clinac C-Series (High Energy)

FDA Registration #2916710

Clinac 2000CR

Clinac Model:	Clinac 2000CR
Computer Platform:	Dell Optiplex GXa, GXi, or GX1, with MS-DOS 6.22.
Varian Software Releases:	5.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	Yes
Description of Compliance Problems:	None
Solution/Workaround:	N/A
FDA Code:	N/A
Date of Expected Solution:	N/A

Clinac Model:	Clinac 2000CR
Computer Platform:	Dell Optiplex GXa, GXi, or GX1, with MS-DOS 6.22
Varian Software Releases:	5.2
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	The January 01, 2000 date may display in log viewers and on printouts as 1/01/100. Actual log dates are recorded correctly.

Solution/Workaround:	The Clinac C-Series Console Software Release 5.4 will resolve the appearence of the 1/01/100 date in log viewer and printout.
FDA Code:	1. M 2. HU-C/Currently Available
Date of Expected Solution:	Currently Available

Clinac 2100C or 2100C/D

Clinac Model:	Clinac 2100C or 2100C/D
Computer Platform:	Dell Optiplex GXa, GXi, or GX1, with MS-DOS 6.22.
Varian Software Releases:	5.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	Yes
Description of Compliance Problems:	None
Solution/Workaround:	N/A
FDA Code:	N/A
Date of Expected Solution:	N/A

Clinac Model:	Clinac 2100C or 2100C/D
Computer Platform:	IBM PS/2 or Dell with MS-DOS 6.22.
Varian Software Releases:	5.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac.
Solution/Workaround:	To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics

	Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**.
FDA Code:	M
Date of Expected Solution:	Currently Available

Clinac Model:	Clinac 2100C or 2100C/D
Computer Platform:	IBM PS/2 or Dell with MS-DOS 6.22.
Varian Software Releases:	5.2
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	1. When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac. 2. The January 01, 2000 date may display in log viewers and on printouts as 1/01/100. Actual log dates are recorded correctly.
Solution/Workaround:	1. To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**. 2. The Clinac C-Series Console Software Release 5.4 will resolve the appearence of the 1/01/100 date in log viewer and printout.
FDA Code:	1. M 2. HU-C/Currently Available

Date of Expected Solution:	Currently Available

Clinac Model:	Clinac 2100C or 2100C/D
Computer Platform:	IBM PS/2 or Dell with MS-DOS 3.3.
Varian Software Releases:	4.21 and 4.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	1. When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac. 2. The January 01, 2000 date may display in log viewers and on printouts as 1/01/100. Actual log dates are recorded correctly.
Solution/Workaround:	1. To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**. 2. The Clinac C-Series Console Software Release 5.4 will resolve the appearence of the 1/01/100 date in log viewer and printout.
FDA Code:	1. M 2. HU-C/Currently Available
Date of Expected Solution:	Currently Available

Clinac Model:	Clinac 2100C or 2100C/D
Computer Platform:	IBM PS/2 with DOS 3.3
Varian Software Releases:	3.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	1. When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac. 2. The January 01, 2000 date may display in log viewers and on printouts as 1/01/100. Actual log dates are recorded correctly.
Solution/Workaround:	1. To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**. 2. The Clinac C-Series Console Software Release 5.4 will resolve the appearence of the 1/01/100 date in log viewer and printout.
FDA Code:	1. M 2. HU-C/Currently Available
Date of Expected Solution:	Currently Available

Clinac Model:	Clinac 2100C or 2100C/D
Computer Platform:	IBM PS/2 with DOS 3.3
Varian Software Releases:	2.37
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac.
Solution/Workaround:	To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**
FDA Code:	M
Date of Expected Solution:	Currently Available.

Clinac 2300 C/D

Clinac Model:	Clinac 2300C/D
Computer Platform:	Dell Optiplex GXa, GXi, or GX1, with MS-DOS 6.22.
Varian Software Releases:	5.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	Yes
Description of Compliance Problems:	None
Solution/Workaround:	N/A
FDA Code:	N/A
Date of Expected Solution:	N/A

Clinac Model:	Clinac 2300C/D
Computer Platform:	IBM PS/2 or Dell with MS-DOS 6.22.
Varian Software Releases:	5.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac.
Solution/Workaround:	To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**.
FDA Code:	M
Date of Expected Solution:	Currently Available

Clinac Model:	Clinac 2300C/D
Computer Platform:	IBM PS/2 or Dell with MS-DOS 6.22.
Varian Software Releases:	5.2
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	1. When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac. 2. The January 01, 2000 date may display in log viewers and on printouts as 1/01/100. Actual log dates are recorded correctly.

Solution/Workaround:	1. To resolve ambiguous date reset after automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**. 2. The Clinac C-Series Console Software Release 5.4 will resolve the appearence of the 1/01/100 date in log viewer and printout.
FDA Code:	1. M 2. HU-C/Currently Available
Date of Expected Solution:	Currently Available

Clinac Model:	Clinac 2300C/D
Computer Platform:	IBM PS/2 or Dell with MS-DOS 3.3.
Varian Software Releases:	4.21 and 4.4
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	1. When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 01, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac. 2. The January 01, 2000 date may display in log viewers and on printouts as 1/01/100. Actual log dates are recorded correctly.
Solution/Workaround:	1. To resolve ambiguous date reset after

	automatic transition from December 31, 1999 to January 01, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/ Set Date window the *first* time they use the system after the turn of the century.**. 2. The Clinac C-Series Console Software Release 5.4 will resolve the appearence of the 1/01/100 date in log viewer and printout.
FDA Code:	1. M 2. HU-C/Currently Available
Date of Expected Solution:	Currently Available

Clinac 2500C

Clinac Model:	Clinac 2500C
Computer Platform:	IBM PS/2 with DOS 3.3
Varian Software Releases:	2.37
Where Is Date Used?	1. DOS 2. Clinac Console Software
Year 2000 Compliant?	No
Description of Compliance Problems:	When the Clinac console computer is reset or powered "off" and then "on" after the date automatically transitions from December 31, 1999 to January 1, 2000, the date resets to January 4, 1980, which is then displayed and recorded by the Clinac.
Solution/Workaround:	To resolve the ambiguous date reset after automatic transition from December 31, 1999 to January 1, 2000, the customer needs to set the date to the correct current date (01/01/2000) in the Physics Mode/Utilities/Set Date window the *first* time they use the system after the turn of the century.**
FDA Code:	M
Date of Expected Solution:	Currently available.

**When accessing Physics Mode/Utilities/Set Date window to set the date after the computer transitions from 12/31/1999 to 01/01/2000, the default date displayed in the /Set Date window may initially appear as 01/01/1900.

Included among the Year 2000 related testing done by Varian for its high-energy Clinac products were the following tests:

- Progression from December 31, 1999 to January 1, 2000.
- Recognition of and support for the year 2000 as a leap year.
- Power cycle test to determine whether the system retained the correct century information after the system clock rolls over automatically to January 1, 2000.
- Power cycle test to determine whether the system retained the correct century information after a manual update of the system clock to January 1, 2000.

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Last revised November 10, 1998.

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Year 2000 Information: Introduction

FDA Registration #2916710

Varian Oncology Systems has created this website to better serve our customers and to respond to the FDA's request of January 21, 1998.

Varian Associates, Inc. (Varian) has taken many steps toward addressing Year 2000 compliance in its business and products. We are aware that as the new century approaches, many of our customers are in need of information in order to assess their readiness. Varian is committed to making it as easy as possible for each of our customers to prepare an individual Year 2000 Plan. The information on the Varian Year 2000 web site and the Varian Customer Technical Bulletin, **Identifying Computer Platforms on Varian Products**, should enable qualified Bio-medical personnel to conduct a facility self-evaluation.

Users and potential purchasers of Varian Oncology Systems products are advised to independently verify the pertinent information for specific, critical products. If you would like Varian's assistance in conducting an assessment of your equipment, please contact your **Customer Support Representative**. Our team is available to visit any customer site to assist with Year 2000 assessments.

If you wish to schedule upgrades to your Varian products, please contact your Customer Support Representative as soon as possible. Purchase orders for optional upgrades should be placed by June 30, 1999 in order to insure they can be installed before the end of the year.

The Year 2000 readiness information provided at this site is the best available information as of the last revision date set forth below and is intended for the convenience of our customers only. The list of Varian manufactured products set forth in this web site is derived from our current records. As new information becomes available, we will continually update our web site. Please consult it frequently over the coming months.

For Year 2000 information on any Varian product not found on this web site, or if you have questions regarding the web site information on Varian Oncology Systems Year 2000 readiness.

Kenneth McCain

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Year 2000 Information: Year 2000 Readiness Disclosure

FDA Registration #2916710

Varian Associates, Inc. is aware that some software and computer systems will experience operability problems associated with the date change for the year 2000 (the "Year 2000 Issue"). Varian has prepared this disclosure to respond to the inquiries and questions that Varian has received regarding the Year 2000 Issue and to provide information regarding the steps being taken by Varian.

Definition of "Year 2000 Readiness"

Varian has adopted the following as its definition of Year 2000 readiness:

1. **General Integrity**: No value for the current date will cause interruptions of desired operation.
2. **Date Integrity**: All calculations of time-related data (dates, durations, days of the week, leap year) will produce desired results for all valid dates within the application domain.
3. **Date Representation**: Date elements in interfaces and data storage permit specifying century to eliminate date ambiguity, or for any date element represented without century, the correct century is unambiguous for all manipulations involving that element.

Business Readiness

Varian has considered the Year 2000 Issue and has implemented a plan to ensure that its internal systems will operate without significant interruption at the turn of the century (the "Varian Readiness Plan"). The Varian Readiness Plan covers all Varian businesses. Varian does not anticipate that the Year 2000 Issue will interrupt its normal internal operations to any significant extent.

Product Readiness

Varian has taken steps to assess the effect, if any, of the date change on its product models currently manufactured and offered for sale ("current products").

*Pursuant to the Year 2000 Information and Readiness Disclosure Act, Varian hereby designates all of its Year 2000 Compliance Statements made between January 1st of 1996 and December 3rd of 1998 as "Year 2000 Readiness Disclosures." **A copy of the Year 2000 statement** which has now been designated as a Year 2000 Readiness Disclosure is attached.*

This disclosure is provided subject to Varian's applicable standard Terms and Conditions of Sale, which are incorporated by this reference, copies of which are available upon request from your Varian representative. This disclosure is not intended to alter or enlarge any of the rights, obligations, remedies or other contents of the Terms and Conditions of Sale. In the event of any inconsistency between this disclosure and the Terms and Conditions of Sale, the Terms and Conditions of Sale will control. Varian is continuing to assess its products and will update this information accordingly.

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Reclassified Year 2000 Readiness Disclosure

Year 2000 Information: Year 2000 Compliance Statement

FDA Registration #2916710

Varian Associates, Inc. is aware that some software and computer systems will experience operability problems associated with the date change for the year 2000 (the "Year 2000 Issue"). Varian has prepared this statement to respond to the inquiries and questions that Varian has received regarding the Year 2000 Issue and to provide information regarding the steps being taken by Varian.

Definition of "Year 2000 Compliance"

Varian has adopted the following as its definition of Year 2000 Compliance:

1. **General Integrity**: No value for the current date will cause interruptions of desired operation.
2. **Date Integrity**: All calculations of time-related data (dates, durations, days of the week, leap year) will produce desired results for all valid dates within the application domain.
3. **Date Representation**: Date elements in interfaces and data storage permit specifying century to eliminate date ambiguity, or for any date element represented without century, the correct century is unambiguous for all manipulations involving that element.

Business Compliance

Varian has considered the Year 2000 Issue and has implemented a plan to ensure that its internal systems will operate without significant interruption at the turn of the century (the "Varian Compliance Plan"). The Varian Compliance Plan covers all Varian businesses. Varian does not anticipate that the Year 2000 Issue will interrupt its normal internal operations to any significant

extent.

Product Compliance

Varian has taken steps to assess the effect, if any, of the date change on its product models currently manufactured and offered for sale ("current products").

This statement is provided subject to Varian's applicable standard Terms and Conditions of Sale, which are incorporated by this reference, copies of which are available upon request from your Varian representative. This statement is not intended to alter or enlarge any of the rights, obligations, remedies or other contents of the Terms and Conditions of Sale. In the event of any inconsistency between this statement and the Terms and Conditions of Sale, the Terms and Conditions of Sale will control. Varian is continuing to assess its products and will update this information accordingly.

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Year 2000 Information: A Letter From Tim Guertin, Varian Oncology Systems

FDA Registration #2916710

Varian Associates, Inc.
EXECUTIVE OFFICES

TIMOTHY E. GUERTIN
CORPORATE VICE PRESIDENT
PRESIDENT, ONCOLOGY SYSTEMS

February 24, 1999

Re: **Year 2000 Readiness Disclosure**

Dear Customer:

Varian Associates, Inc. (Varian) has taken many steps toward addressing Year 2000 compliance in its business and products. We are aware that as the new century approaches, many of our customers are in need of information in order to assess their readiness. This letter is to summarize Varian's position with regard to the following issues: the definition(s) of Year 2000 compliance; Varian's Year 2000 actions to date; and our planned actions to be your Radiotherapy provider into the millenium.

Definitions of Year 2000 compliance:

Varian's Definition

Varian has adopted the following as its definition of Year 2000 Compliance:

1. **General Integrity**: No value for the current date will cause interruptions of desired operation.
2. **Date Integrity**: All calculations of time-related data (dates, duration, days of the week, etc.) will produce desired results for all valid dates within the applications domain.
3. **Date Representation**: Date elements in interfaces and data storage permit specifying century, the correct century in unambiguous for all manipulations involving that element.

Department of Health & Human Services Definition

As guidance for manufacturers, the Department of Health and Human Services (HHS) has issued the following definition: "For the purpose of this product status reporting, Year 2000 compliant means, with respect to medical devices and scientific laboratory equipment, that the product accurately processes and stores date/time data (including, but not limited to calculating, comparing, displaying, recording and sequencing operations involving date/time data) during, from into and between the twentieth and twenty-first centuries, and the years 1999 and 2000, including correct processing of leap year data."

Compliance Information

Based upon the HHS definition, and Varian's interpretation of that definition, Varian has tested and validated all of its current and most of its previously manufactured products. To the best of our knowledge, nearly all current Varian product versions are Year 2000 compliant according to the definition given above. However, some prior versions of Varian products made use of commercial computers and software development tools and methods which, although state-of-the-art and the best obtainable at the time, were not always Year 2000 compliant.

Based on the results of our testing and the information provided by computer software and hardware vendors, we have developed a table of compliance and upgrade information. This information has been posted on our website at **http://www.os.varian.com/cs/year2000/**. The current website information has also been included with this letter. Very few of these situations have been found to effect patient safety. Most produce minor or cosmetic defects, or require minor one-time user actions. However, some older versions of VARiS and RMS should be upgraded to achieve continued operation after January 1, 2000.

Copies of our Year 2000 Compliance Statement are also enclosed. Several customers have also requested information via special Year 2000 questionnaires/surveys. Since it is not practical for Varian to insure that we meet the specific requirements of hundreds of different legal compliance definitions, we must reply to requests for compliance information using the definitions developed by Varian and/or the HHS definition.

It is also important to note that our customers have a wide variety of equipment configurations, some of which were not purchased through Varian, which make it impossible to provide a blanket compliance statement for configured systems. For example, a customer may use a Varian Multi-leaf Collimator with any of the following computers: Intel 80386, 80486, Pentium I, or Pentium II. The level of compliance may vary depending upon the type of computer used and the version of software the user has.

Safety Related Assessments

Any non-compliant software that we believe could cause a mistreatment will be upgraded to a compliant version free of charge. These upgrades will not necessarily be to the most recent product release. Varian will contact you to schedule these free safety related upgrades, which include certain older versions of CadPlan and PortalVision. No version of the Clinac or Ximatron is known to have a safety issue, although some older versions will have minor date related problems.

Customer Service Support

Varian is committed to making it as easy as possible for each of you to prepare an individual Year 2000 Plan. The information on our website should enable qualified Bio-medical personnel to conduct a facility self-evaluation.

If you would like Varian's assistance in conducting an assessment of your equipment, please contact your Customer Service Representative. Our Customer Service team is also available to visit any customer site to assist with Year 2000 assessments. Varian will offer special pricing to customers who have purchased service contract coverage, and we will in the future offer versions of service contracts which cover optional Year 2000 upgrades.

If you wish to schedule upgrades to your Varian products, please contact us as soon as possible. Our contact information is attached to this letter. In order to make sure we can accommodate all customers, we ask that you make inspection requests, for either a phone or on-site visit, before January 30, 1999. We hope to complete these customer requested inspections by March 30, 1999. Purchase orders for optional upgrades should be placed by June 30, 1999 in order to insure they can be installed before the end of the year.

As new information becomes available, we will continually update our website. Please consult it frequently over the coming months.

Very truly yours,

Tim Guertin
President
Varian Oncology Systems

Linda S Nash
Manager
Regulatory Compliance

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Last revised February 2, 1999.

SIEMENS

Siemens Medical Engineering Group
Information Site for
Year 2000 Issues

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Welcome to the Siemens Medical Engineering Group Year 2000 web-site

The new millennium is just around the corner. There are only **298** calendar days left until the Year 2000 change. For our part, we have a comprehensive Y2K program in program in progress, and will be releasing new information on this web-site routinely.

This site was created as a central resource to provide up-to-date Year 2000 reference information about our medical products and Year 2000 related policies and programs.

The principal content of this web-site is directed to Siemens customers in order to assist them with a timely and problem free transition into the next century.

New to this web-site is a section for suppliers who provide equipment, components and parts to the Siemens Medical Engineering Group.

Siemens customer Year 2000 section

Siemens supplier Year 2000 section

The information on this website constitutes a Year 2000 Readiness Disclosure

This website is updated periodically. Please check again for new information.

Last update: 24 February 1999

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Year 2000 software solutions are designed to modify the system software so that neither its performance nor its functionality are materially adversely affected as a result of the date change from 1999 to 2000, including leap year calculations. Siemens AG Medical Engineering Group is not responsible for system modifications made by unauthorized service providers. This information does not affect existing warranties, warranty exclusions, exclusive warranty remedies or limitations of liability.

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Comments and suggestions to: Global Contacts for Year 2000

SIEMENS

Year 2000
Program Information

Siemens Medical Engineering Group's Year 2000 Statement

All Siemens manufactured medical products purchased from Siemens after October 1st, 1997, are either Year 2000 compliant, or will be updated to be Year 2000 compliant **free of charge** in sufficient time before the millennium change, irrespective of standard warranty terms or service contract status.

All Year 2000 affected Siemens manufactured products not in current production but covered by Siemens Medical Engineering Group full service contracts will receive Year 2000 updates free of charge provided a Year 2000 update is developed for the system as reported on this website in the section Year 2000 Product Information.

All customers with Year 2000 affected Siemens manufactured products not covered by Siemens Medical Engineering Group full service contracts will be offered a solution. The software element of this solution will be **free of charge***, but a charge will be made for the implementation performed by Siemens customer service as well as for any necessary hardware upgrades. For systems which have not been maintained to the latest hardware and software revision level, it may also be necessary to perform such chargeable upgrades first, before the Year 2000

update can be installed.

* Provided that, by 31.12.1999, the products will not have exceeded their operational lifespan and serviceability.

Making Year 2000 corrective actions on your own

Siemens customers who have qualified in-house or third party support, and sign a release form prior to acquiring the software update, may implement a solution on their own if they elect to do so.

The "Functional Workaround" - what it means

When a software solution is not practical, a Functional Workaround can provide a means to continue the functional operation (excluding the date/time functions) of a Year 2000 affected system, provided it does not interfere with the system's contribution to good medical practice.

Pre-owned systems, manufactured by Siemens Medical Engineering Group

Unfortunately, we do not have a record of ownership or location for Siemens products purchased from a source other than Siemens or an authorized Siemens representative. Therefore, we are unable to contact these customers. If you have a pre-owned system manufactured by Siemens Medical Engineering Group, please contact our regional Year 2000 representative..

Multi-vendor service customer advisory for non-Siemens brand products

It is not appropriate for Siemens to provide Year 2000 corrective support for equipment manufactured by other vendors (non-Siemens brand products). Software code for these

products is proprietary information to which Siemens Medical Engineering Group does not have access. Accordingly, we will not determine the Year 2000 compliance of any third-party supplied products which may be connected to or have operation interfaces with Siemens products. Further, Siemens will not accept responsibility for these or any possible impact of such equipment on Siemens supplied products. However, we are prepared to discuss with customers the evaluation of risks and possible solutions in such cases. Please contact our Year 2000 regional representative for further information.

Non-Siemens brand products, manufactured by companies not controlled by Siemens, distributed by Siemens Medical Engineering Group

Our position is the same as that given in the statement concerning multi-vendor service products. It is not appropriate for Siemens to provide Year 2000 corrective support for equipment manufactured by other vendors, nor is it appropriate for us to determine the Year 2000 compliance of any third-party supplied products which may be connected to or have operation interfaces with Siemens products (e.g. laser cameras or printers). However, we will try to obtain Year 2000 status and update information regarding non-Siemens brand products from the product manufacturer.

Please contact our Year 2000 regional representative for further information. Please be advised that attempts to contact other equipment manufacturers for related information are ongoing, and useful information will be posted when available.

How to clarify the Year 2000 status of equipment not included in the Siemens Medical Engineering Group product information

Please contact our regional Year 2000 representative for further information.

representative for further information.

Connect here to the FDA Year 2000 web-site.

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Comments and suggestions to: Global Contacts for Year 2000

SIEMENS

Health Care Solutions

Year 2000

Product **Information**

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Oncology Systems

Explanations to comments

1) The Software version listed and all versions released after the listed version will work properly in the Year 2000. If the software version installed at your system was released before the listed one, please contact our Year 2000 representative in your country. He will also be able to assist you in identifying the software version installed on your system.

2) Your system will be affected by the Year 2000 change. Please contact our Year 2000 representative for further information. He will be able to recommend you the solution best suited for your configuration.

3) If your system is equipped with a digital imaging system, the digital imaging system has to be checked independently.

4) Product is obsolete or beyond reasonable useful service life and no upgrade will be provided.

A - M P - Z

Product name / Model	SW-version required	Comment	Potential Year 2000 effects	Date of availability
BEAMVIEW		Upgrade to BV+	-	available
BEAMVIEW PLUS	V1.1	not affected	-	
BETATRON (all types)	-	not affected	-	-
CAESA - GAMMATRON	-	not affected	-	-
Dermopan 2	-	not affected	-	

DVS	under investigation	Please watch this page for updates	under investigation	-
Evados	under investigation	4); affected, looking for workaround	under investigation	
GAMMATRON 1, 2, 3, R, S	-	not affected	-	-
Lantis / DOS and NT Versions	V4.01 or later	1) Upgrade being tested	-	Q4 - 1998
Lantis PC Hardware, Novell and NT Networks for Lantis including all Lantis modules and ImageRT and BeamShaper	V4.01 or later	1) Upgrade being tested	-	Q4 - 1998
Mevamatic 2	under investigation	4); affected, looking for workaround	under investigation	
Mevamatic 3	under investigation	Please watch this page for updates	under investigation	
Mevaplan	under investigation	Please watch this page for updates	under investigation	
MevaSim, MevaSim S	-	not affected	-	
MEVATRONs, All Conventional Types	-	not affected	-	
MEVATRONs, All Digital Types including PRIMUS	-	not affected	-	

Product name / Model	SW-version required	Comment	Potential Year 2000 effects	Date of availability
PRIMEVIEW	-	not affected	-	
RDS	-	Requires a Bios patch	-	Q4 - 1998
SIDOS	under investigation	4); affected, looking for workaround	under investigation	
SimView 3000	3.61 PATCH 1 or 4.0 PATCH 2	Upgrade in preparation	-	Q4 - 1998
SimView 3000 CT Option	PATCH 3	Upgrade available	-	Q4 - 1998
Stabilipan I & II	-	not affected	-	
TDMS	-	Replaced by Lantis.	-	Q3 - 1995
TMS	V4.0	Please watch this page for updates	-	

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Comments and suggestions to: Global Contacts for Year 2000

SIEMENS

Year 2000 Delivery Reliability

fit for 2000 Siemens Med

1. Definition of delivery reliability

In connection with the year 2000 problem, delivery reliability is understood to mean that the processing methods of the supplier conforms to the standard DISC PD2000-1:1998 of the British Standards Institution, are reliable for the year 2000 and beyond, and no delays in delivery will occur with the onset of the year 2000.

2. Status of delivery reliability

What is the status of your delivery reliability in relation to the year 2000 problem?

- (•) compatible for the year 2000 and beyond, can be audited
- ( ) compatible for the year 2000 will be in effect on time, at the latest by _____
- ( ) not compatible for the year 2000 and beyond

3. Contact

Name: _____

Department:

Telephone No.:

Fax No.:

E-Mail:

Company:

Street:

ZIP Code:

City:

Country:

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Comments and suggestions to: Global Contacts for Year 2000

THERATRONICS

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THERAPLAN Plus | THERATRON | Cobalt Sources | Other Products

All of THERATRONICS current products have been designed and tested to be year 2000 compliant. These include the THERATRON 780E, 1000E and the Phoenix radiation treatment units, and the THERAPLAN Plus 3D radiation treatment planning systems.

Earlier models of the THERATRON radiation treatment units have been reviewed and determined to be year 2000 compliant.

All known users of earlier models of TP11/THERAPLAN treatment planning systems have been contacted and provided with several options to address year 2000 issues on their systems.

Any users requiring further information on year 2000 issues applicable to their THERATRONICS equipment may contact us at: qa@theratronics.com

Back to Products Page

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Last updated on 6 October 1998.

Contact Us

Site Map

Welcome to the MDS Nordion Web Site

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For questions related to MDS Nordion's Year 2000 compliance program, please contact year2000@mds.nordion.com.

Please use the large icons to visit the introductory level to each section or follow the links under the icons directly to the sub-sections of interest to you.

Sections françaises

MDS Nordion
Science Advancing Health

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What's New on the MDS Nordion Web Site

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MDS Buys German Cancer Therapy Company
December 17, 1998 continue

MDS Nordion Announces $12.3 Million Expansion Plan
June 25, 1998 continue

MDS Acquires Theratronics: Acquisition Will Expand Leadership in Isotope-Based Radiation Therapy
May 20, 1998 continue

NorDOSE: Finally... Dosimetry made

quick and easy!

The Maple Reactor Project
The latest information on MDS Nordion's plans to build two new medical isotope reactors and a processing facility.

Career Opportunities
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Nucletron

Year 2000

Nucletron Year 2000 Policy

Nucletron - taking care of your Year 2000 concerns

Nucletron is aware of its customers concerns about the effect that the change of date at the turn of the century may have on their equipment, and is committed to making the transition as trouble free as possible. To help you keep your operations running, Nucletron has initiated a Year 2000 Compliance Program for new and existing products.

How will the Nucletron Year 2000 Compliance Program help?

- Nucletron has established a specification for Year 2000 compliance that covers all aspects of date sensitive operations.

- Nucletron will test all new and existing company products against the Year 2000 compliance specifications.

- Nucletron will classify all new and existing company products on the basis of how well they meet the Year 2000 compliance specifications.

- Nucletron is offering their customers, all necessary software and firmware updates or an advised functional workaround in order to make all systems compliant.

Note however that Nucletron cannot confirm that third party equipment which interfaces to its products, is Year 2000 compliant. Nucletron can only guarantee that its products will send and/or receive data according to the official published Nucletron product specifications.

What is the Nucletron Year 2000 compliance specification?

Year 2000 compliance for Nucletron products means:

1. Date-based functionality, such as calculations using dates, data-storage/-retrieval/-transfer; data-printing/-plotting/-filming, scheduling functions and patient treatment, must behave consistently and without deviation from specification for dates.

2. Specifically, no value for current date, from, into and between the years 1999 and 2000, will cause any interruption in operation.

3. In all interfaces and data storage, the century in any date must be specified either explicitly or use unambiguous algorithms or inferencing rules.

What are the compliance classifications?

Class	Level of Year 2000 compliance	Remarks
Class 1	Fully compliant	Fulfils all requirements in the Nucletron Year 2000 specification.
Class 2	Compliant except for minor issues	Fulfils all requirements in the Nucletron Year 2000 specification, except that date is presented as 2 digits on print-out and screen layouts. This date is used for presentation only. No safety hazard can occur.
Class 3	Not Year 2000 compliant	Product does not fulfil the requirements in the Nucletron Year 2000 specification.
Class 4	Year 2000 compliance not yet known	Products in the process of being classified.

What does this mean for my system?

This depends on the classification of your Nucletron products and also on the customer program that applies to you. You can get more detailed information from your local Sales Representative, but in general these comments apply.

For products installed after 1 July 1998:

- These products either are already Year 2000 compliant or will be made compliant before July 1999 (Class 1 or 2).

- For any non-compliant products (Class 3) delivered after 1 July 1998 Nucletron will provide, free of charge, all software and firmware updates to ensure compliance before

the year 2000.

- **Year 2000 classification of currently delivered Nucletron Products**
- **Year 2000 classification of currently delivered and previously installed Nucletron products**

For products installed before 1 July 1998:

• Class 1 products already meet the Nucletron Year 2000 specification.

• Class 2 products are compliant with the exception noted in the classification table above and no safety hazard can occur. If you currently have a Nucletron service contract or the product is still under warranty and a Class 1 software/firmware version is available, you will receive an update free of charge. If the warranty period has expired and you do not already have a service contract, please contact your local Sales Representative.

In some cases Class 1 software/firmware versions are planned to be introduced before 31 December 1999. In case you have a service contract at the time of introduction or the product is still under warranty, you will receive the update free of charge.

• Class 3 products are not Year 2000 compliant. If a Class 1 or Class 2 software/firmware version is available or is planned to be introduced before 31 December 1999 you will be offered a version free of charge. Where an update is not available or planned for, you will receive a written notification from Nucletron stating the possible hazards that may occur and an advised functional workaround.

Note that different policies for hardware upgrades and installation services may apply, depending on the product version, individual warranty period and service contract conditions

[Main] [Menu] [Year 2000 Status] [Y2k Classification]

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Nucletron

Year 2000 classification of currently delivered Nucletron Products

Product	Software/ Firmware version	YEAR 2000 Classification	Remark
Remote Afterloading			
microSelectron-HDR	1.20	1	
microSelectron-PDR	5.00	2	
Selectron-LDR	4.40	2	Selectron-LDR with single remote control and three patient print-out
	4.30	2	Selectron-LDR with dual remote control and two patient print-out
	4.10	2	Selectron-LDR with single remote control and two patient print-out
Nucletron Radiation Monitor	1.20	3	
	1.30*	2	Release in 1999
PLATO External Beam			
RTS (incl. RTS 3D)	2.0.1	2	
	2.1*	1	Release March 1999
Shape/MLC	2.2	2	
	2.3*	1	Release March 1999
BDAS	2.2	2	
PLATO Brachytherapy-Remote Afterloading			
BPS (incl. BPS 3D)	13.5	2	
	14.0*	1	Release March 1999
PLATO Brachytherapy-Seeds			
BPS MLDR/SEED	11.31	3	
	11.32*	1	Release July 1999
PLATO Stereotactic Radiosurgery			
SRS	1.4	2	
	1.5*	1	Release March 1999
SCT	1.4	2	
	1.5*	1	Release March 1999

SAS	1.2	2	
	1.3*	1	Release March 1999
PLATO Platform License			
PSS	2.5	1	
	3.0*	1	Release March 1999
IPS-CT	2.4	2	
	2.5*	1	Release March 1999
EVAL/RBS	2.3	2	
	2.4*	2	Release March 1999
PLATO Virtual Simulation			
VSS	1.0*	1	Release March 1999
PLATO Image Processing			
DICOM 3 Image Server	1.1	1	
	2.0*	1	Release March 1999
IPS-Xray	2.4	1	VIDAR scanner
	2.5*	1	VIDAR scanner. Release March 1999
	2.0.9	1	Truvel scanner
	2.0.10*	1	Truvel scanner. Release March 1999
Simulator			
Simulix-HP	1.10	2	
Simulix-MCR	1.10	2	
Digital Therapy Imaging (DTI)	1.3	1	
CTX (for MC and HP)	1.5 (incl. March '99 Year 2000 Patch	1	Note: CTX versions installed after 31 March 1999 are Class 1 compliant. CTX versions installed before 31 March 1999 need a Year 2000 patch for Class 1 compliance. Contact your local sales representative
Radiotherapy Information Systems			
Veriflex R&V	2.05	2	
Veriflex VRM	2.10	2	
Integrated Brachytherapy Unit - IBU			
IBU	3.0	3	
	3.1*	1	Release in 1999
BPS (incl. BPS 3D)	13.5	2	
	14.0*	1	Release March 1999

* Product is not yet released

This list specifies the Year 2000 Classification of all Nucletron products in their currently delivered version. The classification code has been defined in the Nucletron Year 2000 Policy.

If a new product release is planned, the version number is marked with an Asterisk. All future versions of the listed products will have an equal or higher compliance classification. This list will be updated as soon as new

information becomes available.

Note:Nucletron cannot confirm that third party equipment which interfaces to its products is Year 2000 compliant. Nucletron can only guarantee that its products will send and/or receive data according to published Nucletron specification

Note: Nucletron cannot be held responsible for system modifications made by any other party or any failure to properly maintain, operate or support any product. Nucletron reserves the right to update the information presented.

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Nucletron

Y2k Classification

Product line: Afterloading

Product:	*Software/ Firmware Version:*	*Year 2000 Classification:*	*Remark:*
microSelectron-HDR	v1.20	1	Current version
	v1.10	2	Upgrade to v1.20.
	V1.01	2	Upgrade to v1.20.
	Lower than v1.01	3	Upgrade to v1.20.
microSelectron-HDR Classic + Control Unit[1]	v7.02a	2	Latest version
	Lower than v7.02a	3	Upgrade to v7.02a.
microSelectron-HDR Classic + TCS[2]	v1.20*	1	Release first half of 1999
	v1.10	2	Current version. Upgrade to v1.20 when available
	v1.01	2	Upgrade to v1.20 when available
	Lower than v1.01	3	Upgrade to v1.20 when available
microSelectron-PDR	v5.00	2	Current version
	Lower than v5.00	3	Upgrade to v5.00.
microSelectron-LDR[1] w/Printina Printer (with serial output option)	v4.10	2	Latest version
microSelectron-LDR[1] w/Printina Printer (without serial output option)	v3.10	2	Latest version
	Lower than v3.10	3	Contact your local sales representative for replacement information.
microSelectron-LDR[1] w/Seiko Printer (with serial output option)	v6.0x	2	Latest version
microSelectron-LDR[1] w/Seiko Printer (without serial output option)	v5.0x	2	Latest version
	Lower than 5.00	3	Contact your local sales representative for replacement information.
Selectron-LDR[1] w/Printina Printer (single remote control and three patient print-out)	v3.41	2	Latest version

Selectron-LDR[1] w/Printina Printer (dual remote control and two patient print-out)	v3.34	2	Latest version
Selectron-LDR[1] w/Printina Printer (single remote control and two patient print-out)	v3.14	2	Latest version
	All others	3	Upgrade to v3.14, v3.34 or v3.41.
Selectron-LDR w/Seiko Printer (single remote control and three patient print-out)	v4.40	2	Current version
Selectron-LDR w/Seiko Printer (dual remote control and two patient print-out)	v4.31*	1	Release first half of 1999
Selectron-LDR w/Seiko Printer (dual remote control and two patient print-out)	v4.30	2	Current version
Selectron-LDR w/Seiko Printer (single remote control and two patient print-out)	v4.10	2	Current version
	All others	3	Contact your local sales representative for upgrade/replacement information
Selectron-HDR[1]	All	3	End-of-life announced. Contact your local sales representative for workaround and replacement information.
VPS[1] (Verification and Protocolling System for Brachytherapy)	v3.10	2	Latest version
	Lower than v3.10	3	Upgrade to v3.10.
Nucletron Radiation Monitor	V1.30*	2	Release in 1999
	V1.20	3	Current version. No functional workaround required. Upgrade to v1.30 when available.
	Lower than v1.20	3	No functional workaround required. Upgrade to v1.30 when available.

* Product is planned for but not yet released

[1] Product not for Sale anymore

[2] Product not for Sale in the USA

Note: Nucletron cannot confirm that third party equipment which interfaces to its products is Year 2000 compliant. Nucletron can only guarantee that its products will send and/or receive data according to published Nucletron specifications

Note: Nucletron cannot be held responsible for system modifications made by any other party or any failure to properly maintain, operate or support any product. Nucletron reserves the right to update the information presented

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Nucletron

Y2k Classification

Product line: Treatment Planning Software

Product:	*Software/ Firmware Version:*	*Year 2000 Classification*	*Remark:*
PLATO Brachytherapy Remote Afterloading	v14.0*	1	Release March 1999
PLATO BPS	v13.6*	2	Release March 1999
	v13.5	2	Current version. Upgrade to v13.6 or v14.0 when available
	Lower than v13.5	3	Upgrade to v13.6 or v14.0 when available.
PLATO NPS-UPS	V11.42	3	Current version. Contact your local sales representative for replacement information
	Lower than v11.42	3	Contact your local sales representative for replacement information
PLATO Brachytherapy Seeds	v14.0*	1	Release March 1999
PLATO BPS MLDR/SEED	V11.32*	1	Release in 1999
	V11.31	3	Current version. Contact your local sales representative for upgrade/replacement information
	Lower than v11.31	3	Contact your local sales representative for Upgrade/Replacement information
PLATO RTS	v2.1*	1	Release March 1999
	v2.0.1	2	Current version. Upgrade to v2.1 when available
	v2.0	2	Upgrade to v2.1 when available
	v1.8*	2	Release March 1999
	v1.7	3	Current version. Upgrade to v1.8 or v2.1 when available
	Lower than v1.7	3	Upgrade to v1.8 or v2.1 when available
PSS	v3.0*	1	Release March 1999
	v2.5	1	Current version. Upgrade to v3.0 when available
	Lower than v2.5	3	Upgrade to v3.0 when available
Shape/MLC	v2.3*	1	Release March 1999
	v2.2	2	Current version. Upgrade to v2.3 when available
	v2.1.1*	2	Release March 1999
	v2.1	3	Upgrade to v2.1.1 or v2.3 when available
	Lower than v2.1	3	Upgrade to v2.1.1 or v2.3 when available
BDAS	v2.3*	2	Release March 1999
	v2.2	2	Current version. Upgrade to v2.3 when available
	v2.1	2	Upgrade to v2.3 when available
	Lower than v2.1	3	Upgrade to v2.3 when available
RBS/EVAL	v2.4*	2	Release March 1999
	v2.3	2	Current version. Upgrade to v2.4 when available
	Lower than 2.3	3	Contact your local sales representative for upgrade information
SRS	v1.5*	1	Release March 1999

	v1.4	2	Current version. Upgrade to v1.5 when available
	Lower than v1.4	3	Upgrade to v1.5 when available
SCT	v1.5*	1	Release March 1999
	v1.4	2	Current version. Upgrade to v1.5 when available
	Lower than v1.4	3	Upgrade to v1.5 when available
SAS	v1.3*	1	Release March 1999
	v1.2	2	Current version. Upgrade to v1.3 when available
	Lower than v1.2	3	Upgrade to v1.3 when available
IPS-CT	v2.5*	1	Release March 1999
	v2.4	2	Current version. Upgrade to v2.5 when available
	Lower than v2.4	3	Upgrade to v2.5 when available
VSS (Virtual Simulation System)	v1.0*	1	Release March 1999
IPS-Xray Vidar	v2.5*	1	Release March 1999
	v2.4	1	Current version. Upgrade to v2.5 when available
	Lower than v2.4	3	Upgrade to v2.5 when available.
IPS-Xray Truvel	v2.0.10*	1	Release March 1999
	v2.0.9	1	Current version. Upgrade to v2.0.10 when available
	Lower than v2.0.9	3	Upgrade to v2.0.10 when available.
IPS-IBU	v3.1*	1	Release in 1999
	v3.0	3	Current version. Upgrade to v3.1 when available.
	Lower than v3.0	3	Upgrade to v3.1 when available.
DICOM 3 Image Server	v2.0*	1	Release March 1999
	v1.1	1	Current version. Upgrade to v2.0 when available
	v1.0	3	Upgrade to v2.0 when available.
DOS RTS[1]	all	3	End-of-Life announced. Contact your local sales representative for replacement information
DOS NPS[1]	all	3	End-of-Life announced. Contact your local sales representative for replacement information

* Product is planned for but not yet released

[1] Product not for Sale anymore

[2] Product not for Sale in the USA

Note: Nucletron cannot confirm that third party equipment which interfaces to its products is Year 2000 compliant. Nucletron can only guarantee that its products will send and/or receive data according to published Nucletron specifications

Note: Nucletron cannot be held responsible for system modifications made by any other party or any failure to properly maintain, operate or support any product. Nucletron reserves the right to update the information presented

Product line: Treatment Planning Hardware

Product:	*Software/ Firmware Version:*	*Year 2000 Classification*	*Remark:*
Indigo R3000	IRIX v4.08F/v5.3	3	Contact your local sales representative for replacement information. Furthermore, the new PLATO software (releases after 1998) will not run on the Indigo R3000 anymore (not Year 2000 related). Upgrade to Platform 3502 or 4502.
Indigo R4000[3]			Note: Some none PLATO software related functions might not be Year 2000 compliant. However, Nucletron has tested the PLATO software on the Indigo R4000

	IRIX v5.3	1	compliant. However, Nucletron has tested the PLATO software on the Indigo R4000 and no problems have been seen during Year 2000 testing. The new PLATO software (releases after 1998) will not run on the Indigo R4000 anymore (not Year 2000 related). Upgrade to Platform 3502 or 4502.
IRIS Indy PC[3]	IRIX v5.3	1	**Note:** Some none PLATO software related functions might not be Year 2000 compliant. However, Nucletron has tested the PLATO software on the IRIS Indy PC and no problems have been seen during Year 2000 testing. The new PLATO software (releases after 1998) will not run on the IRIS Indy PC anymore (not Year 2000 related). Upgrade to Platform 3502 or 4502.
IRIS Indy SC[3]	IRIX v5.3	1	**Note:** Some none PLATO software related functions might not be Year 2000 compliant. However, Nucletron has tested the PLATO software on the IRIS Indy SC and no problems have been seen during Year 2000 testing.
IRIS Indigo 2 Bundle[3]	IRIX v5.3	1	**Note:** Some none PLATO software related functions might not be Year 2000 compliant. However, Nucletron has tested the PLATO software on the IRIS Indigo 2 Bundle and no problems have been seen during Year 2000 testing.
Platform 3502[3]	IRIX v6.3	1	**Note:** Some none PLATO software related functions might not be Year 2000 compliant. However, Nucletron has tested the PLATO software on the Platform 3502 and no problems have been seen during Year 2000 testing.
Platform 4502[3]	IRIX v6.3	1	**Note:** Some none PLATO software related functions might not be Year 2000 compliant. However, Nucletron has tested the PLATO software on the Platform 4502 and no problems have been seen during Year 2000 testing.
Platforms (IBM) for DOS based NPS systems	all	3	End-of-Life announced. Contact your local sales representative for Replacement information

* Product is planned for but not yet released

[1] Product not for Sale anymore

[2] Product not for Sale in the USA

[3] In case Silicon Graphics patches are used, other than those supplied/installed by Nucletron, to make the hardware fully Year 2000 compliant, Nucletron will not guarantee the system's Year 2000 compliance nor will it guarantee the system will operate according to published Nucletron specifications.

Note: Nucletron cannot confirm that third party equipment which interfaces to its products is Year 2000 compliant. Nucletron can only guarantee that its products will send and/or receive data according to published Nucletron specifications

Note: Nucletron cannot be held responsible for system modifications made by any other party or any failure to properly maintain, operate or support any product. Nucletron reserves the right to update the information presented

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Nucletron

Year 2000 Status

Year 2000 classification of currently delivered Nucletron Products

Product	Software/ Firmware version	YEAR 2000 Classification	Remark
Remote Afterloading			
microSelectron-HDR	1.20	1	
microSelectron-PDR	5.00	2	
Selectron-LDR	4.40	2	Selectron-LDR with single remote control and three patient print-out
	4.30	2	Selectron-LDR with dual remote control and two patient print-out
	4.10	2	Selectron-LDR with single remote control and two patient print-out
Nucletron Radiation Monitor	1.20	3	
	1.30*	2	Release in 1999
PLATO External Beam			
RTS (incl. RTS 3D)	2.0.1	2	
	2.1*	1	Release March 1999
Shape/MLC	2.2	2	
	2.3*	1	Release March 1999
BDAS	2.2	2	
PLATO Brachytherapy-Remote Afterloading			
BPS (incl. BPS 3D)	13.5	2	
	14.0*	1	Release March 1999
PLATO Brachytherapy-Seeds			
BPS MLDR/SEED	11.31	3	
	11.32*	1	Release July 1999
PLATO Stereotactic Radiosurgery			
SRS	1.4	2	
	1.5*	1	Release March 1999
SCT	1.4	2	
	1.5*	1	Release March 1999

SAS	1.2	2	
	1.3*	1	Release March 1999
PLATO Platform License			
PSS	2.5	1	
	3.0*	1	Release March 1999
IPS-CT	2.4	2	
	2.5*	1	Release March 1999
EVAL/RBS	2.3	2	
	2.4*	2	Release March 1999
PLATO Virtual Simulation			
VSS	1.0*	1	Release March 1999
PLATO Image Processing			
DICOM 3 Image Server	1.1	1	
	2.0*	1	Release March 1999
IPS-Xray	2.4	1	VIDAR scanner
	2.5*	1	VIDAR scanner. Release March 1999
	2.0.9	1	Truvel scanner
	2.0.10*	1	Truvel scanner. Release March 1999
Simulator			
Simulix-HP	1.10	2	
Simulix-MCR	1.10	2	
Digital Therapy Imaging (DTI)	1.3	1	
CTX (for MC and HP)	1.5 (incl. March '99 Year 2000 Patch	1	Note: CTX versions installed after 31 March 1999 are Class 1 compliant. CTX versions installed before 31 March 1999 need a Year 2000 patch for Class 1 compliance. Contact your local sales representative
Radiotherapy Information Systems			
Veriflex R&V	2.05	2	
Veriflex VRM	2.10	2	
Integrated Brachytherapy Unit - IBU			
IBU	3.0	3	
	3.1*	1	Release in 1999
BPS (incl. BPS 3D)	13.5	2	
	14.0*	1	Release March 1999

* Product is not yet released

This list specifies the Year 2000 Classification of all Nucletron products in their currently delivered version. The classification code has been defined in the Nucletron Year 2000 Policy.

If a new product release is planned, the version number is marked with an Asterisk. All future versions of the listed products will have an equal or higher compliance classification. This list will be updated as soon as new

information becomes available.

Note:Nucletron cannot confirm that third party equipment which interfaces to its products is Year 2000 compliant. Nucletron can only guarantee that its products will send and/or receive data according to published Nucletron specification

Note: Nucletron cannot be held responsible for system modifications made by any other party or any failure to properly maintain, operate or support any product. Nucletron reserves the right to update the information presented.

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Year 2000

Year 2000 Compliance

Elekta Oncology Systems are in the process of investigating the issues raised by the Year 2000 (or millennium problem). We have undertaken a full review of all software and hardware products to ensure that full compliance is achieved on all relevant products before the Year 2000 deadline. This investigation is well advanced and we expect this work to be completed by the end of the first quarter 1999.

An updated assessment of the present status has been made and is reported below. This assessment has been complemented with formal validation in accordance with guidelines and compliance definitions issued by organizations such as the IEEE, BSI, FDA, and vendor supplied statements.

For further information on Year 2000 compliance please contact Year 2000 Co-ordinator

Definition of Year 2000 Conformity
FDA Short Codes
Product Status Summary

Definition of Year 2000 Conformity

The definition of year 2000 conformance is taken from BSI DISC PD2000-1.
"Year 2000 conformity shall mean that neither performance nor functionality is affected by dates prior to, during and after the year 2000."
The 'rules' below are taken from PD2000-1.

Rule 1. General Integrity
"No value for current date will cause any interruption in operation"

Rule 2. Date Integrity
"Date-based functionality must behave consistently for dates prior to, during and after year 2000."

All equipment & products must calculate, manipulate & represent dates correctly for the purposes for which they were intended.

Rule 3. Explicit/Implicit Century
"In all interfaces and data storage, the century in any date must be specified either explicitly or by unambiguous algorithms or inferencing rules."
Explicit representation using 4 digits or by including a century indicator or, by use of inferencing rules i.e. using a two-digit year with values greater than 50 implies 19xx. And those with values equal to or less than 50 imply 20xx.

Rule 4. Leap year
"Year 2000 must be recognised as a leap year."

FDA Short Codes

These are the codes, which appear in the comments, column of the product status

summary.

FDA Code	Description
SU/*date*	Software upgrade available by *date*, at no cost to customer.
SU-C/*date*	Software upgrade available by *date*, at a cost to customer.
HU/*date*	Hardware and software upgrade available by *date*, at no cost to customer.
HU-C/*date*	Hardware and software upgrade available by *date*, at a cost to customer.
M	Minor date-related problem with product, which presents no adverse health impact on product function and for which the manufacturer will not provide a correction/upgrade.
O	Product is obsolete or beyond reasonable useful service life and no upgrade will be provided.
AI/*date*	Assessment of compliance status is currently incomplete, but is underway, and information will be made available by *date*.
C	Product Compliant

Product Status Summary

Product Name	Operating system	Year 2000 Compliant	Comment and FDA short code
Precise Treatment System	NT 4.0 RMX 2.4 RMXIII DOSRMX	Yes	C
SL15, SL18, SL20,SL25, SLi/SLi Plus Linac	RMX 2.4	Yes	C from Rel. 3.1
SL15, SL18, SL20,SL25, SLi/SLi Plus Linac + MLCi Multileaf Collimator	RMX 2.4 RMXIII	Yes	C from Rel. 3.1
MLP Treatment Planning System	NT 3.5,3.51,4.0	Yes	C from Rel. 1.1.0
iView Imaging System	NT 4.0	Yes	C
SLS Simulator	None	Yes	C
SLSCT Simulator with CT Attachment	UNIX V/386 Release3.2	Yes	C from Rel. 1.01
Localiser Simulator	None	Yes	C
SRI100 Imaging System 2.1.3, 2.1.6	Dos 5.0	No	M HU-C Currently Available (iView)
SRI100 Imaging System 2.4.0	Dos 6.22	No	M HU-C Currently Available (iView)
SL75 Linac	None	No	M
MLCSA1 Multileaf Collimator	RMX2.4 NFS R2.1 CP/IP V1.3	Yes	C
Render-Plan 3-D	IRIX 5.3	No	M SU-C Currently Available(IRIX 6.5)

Render-Plan 3-D	IRIX 6.2, 6.3	No	M SU-C Currently Available (Y2K patch or IRIX6.5)
Render-Plan 3-D	IRIX 6.5	Yes	C
Vericord S3	RMX 2.4	Yes	C from Rel. 3.1
Precise Treatment Table	None	Yes	C
PSS Ram (Mark I,II,III) System	None	Yes	C
PSS Pedestal System	None	Yes	C

For further information on Year 2000 compliance please contact Year 2000 Co-ordinator

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OHMART VEGA

Dear Valued Customer:

This is in response to your request for information on our Year 2000 plans. We have completed a review of all of our instrumentation to ensure that operation of our equipment at customer sites will not be adversely affected by processing dates beyond the year 2000. Our testing indicates that none of our currently supported microprocessor-based instruments will have failures associated with processing dates beyond December 31, 1999.

We have a task force assigned to guide us through any Year 2000 issues that might arise in connection with our business data. Most of our major systems have been verified to be Year 2000 compliant. We are in the process of verifying the smaller systems, but anticipate no problem in this regard.

We appreciate the opportunity to continue our relationship with you into the year 2000 and beyond.

For specific questions or more information email us at: y2k@ohmartvega.com

Carol C. Ritter

Vice President, Administration

All statements provided by Ohmart/Vega Corporation regarding our Year 2000 Program are designated as Year 2000 Readiness Disclosures under the Year 2000 Information and Readiness Disclosures Act of 1998.

Year 2000 Compliance

Ronan engineering manufactures a wide variety of products generally classified as industrial instrumentation. All Ronan products, with the exception of the X500 Series Sequence of Events Recorders, operate or function independent of the date (e.g. they don't use or provide date related information or their functional characteristics and performance will not be affected or impacted by the century date change). The YR2K compliant Ronan products include the following model numbers.

- **LB Series, LC Series, R100, X1D2, X2, X3, X8, X9, X11, X11N, X11SN, X12, X15, X16, X18, X19, X25, X36, X37, X38, X39, X40, X45, X50, X51, X51N, X54, X54-200 series, X54-600 Series, X54-400, X55-302, X55-304, X55-600, X57, X70, X71, X76, X80, X80-1052, X84, X85, X86, X87, X88, X96, X100, X100N, X110, X120, and misc. power supplies, horns, bells, chimes, relays, switches and push buttons.**

Ronan's Sequence of Events Recorders (SER's -- X500 Series) are "Year 2000" sensitive and will require upgrading as detailed below.

Model X500C and X500D SER's

These models require upgrade to model X500E. This upgrade entails new CPU's, multiplexer controller modules, and certain peripherals. A system specific upgrade proposal can be provided at customer's request. Original system's serial number will be required.

Model X500E SER and X1000 Software

These systems and software require upgrades to allow proper event time tagging and historical event sorting. Upgrade costs will be US$2,000 per CPU. Possible upgrades to higher performance CPU and associated hardware will be system specific and offered at prevailing prices.

To obtain a hardware upgrade proposal, please provide the Ronan Job Number (#XX-XXXX) for the system. Upgrades will commence starting January 1999.

GPS and Time Code Generators

To obtain upgrades for GPS and Time Code Generators supplied by Ronan, please provide the the Model Number(s) and Serial Numbers(s). Upgrades will be available starting before the end of 1998 at prevailing prices.

Company Operations

All Ronan's internal systems and company operations (purchasing, billing, customer service, and related statistical computer databases and systems) are either currently "Year 2000" compliant or anticipated to be compliant on or before August 31, 1999 (Ronan's Fiscal year

end). If there are any additional questions on this subject, feel free to correspond directly with Ronan corporate offices as listed below.

Best Regards

Gary Hirth, Product Manager

Ronan Engineering Co. (Corporate Offices)
21200 Oxnard St.
Woodland Hills. CA 91367. USA
Phone: (800) 327-6626
Fax: (818) 992-6435
E-Mail: garyh@ronan.com

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Center for Devices and Radiological Health

Description of Federal Y2K Biomedical Equipment Clearinghouse Database

Introduction to Product Database

This database has been established to provide information regarding the status or impact on product performance of the "Year 2000 Date Problem" for medical devices and scientific laboratory equipment (biomedical equipment). The information provided here, or the linked sites maintained by manufacturers, have been provided by the manufacturer of the product in response to the January 21, 1998, request from the Deputy Secretary of the Department of Health and Human Services.

This information was requested on behalf of the Federal departments that purchase and use such products and that need to know whether such products are affected to plan remedial actions. Inclusion of information in this database indicates that the manufacturer has certified to the Food and Drug Administration that the data is complete and accurate. The Food and Drug Administration, however, cannot and does not make any independent assurances or guarantees as to the accuracy or completeness of this data.

- Search the Federal Y2K Biomedical Equipment Clearinghouse Database *(Updated as data entered into database)*
- Database Report: Manufacturers Report No Year 2000 Problems OR Product Status is on Manufacturer's Web Page Text A- F, G - L, M - R, S - Z) or PDF *(Last Update 2/15/99)*
- Database Report: Products Reported by Manufacturer to have Date Related Problems OR No Y2K Status Information is Available from the Manufacturer Text A- F, G - L, M - R, S - Z) or PDF *(Last Update 2/15/99)*
- Zipped Copy of Text Delimited Federal Y2K Biomedical Equipment Clearinghouse Database*(Last update 2/15/99)*

  The format of this text delimited file has changed as of 7/15/98. Please read the Description and Layout of File section for more information.

Manufacturers were requested to provide information via one of three ways. Either a certification that none of their products are impacted by date-related problems as defined in the letter or they were requested to provide information on products that they have identified as having a date-related problem under the definition of compliance provided with the letter. Information regarding products with problems can be provided in one of two ways - submission of data to the FDA for posting in the database or provision of a World Wide Web link to a manufacturer-operated Web page where the manufacturer will

provide the specified information.

The information is listed by manufacturer reporting the information and by product and model number. The solutions which the manufacturer has identified to be provided to mitigate the problems, including when assessments will be completed for products whose compliance status assessment is currently incomplete are indicated.

Data is posted to this database as it is received from the manufacturer. Because submission of data is voluntary, data is provided for those manufacturers who have reported. Abscence of any data for a manufacturer indicates that the manufacturer has not reponded. Abscence of data for a particular product for a manufacturer who has responded should be interpreted as an indication of compliance for all of the responding manufacturer's products which are not listed. Of course, there can be no assurance of the compliance status of any manufacturer who does not respond. For manufacturers whose assessments are incomplete, the data posted will be updated when additional information is received from the manufacturer.

Individuals or organizations with questions regarding the status of specific products should contact the manufacturer via the contact points listed. The Food and Drug Administration will not, in general, have information regarding specific products beyond that listed here. In addition, the FDA has not tested or evaluated the Year 2000 compliance status of products listed or not listed in the product database.

Text of letter to manufacturers dated January 21, 1998 from the Deputy Secretary of the Department of Health and Human Services requesting submission of product information

Dear Biomedical Equipment Manufacturer:

The Year 2000 date compliance issue holds serious implications both for the patient care and scientific research activities of the Federal government, and for the nation's health care providers and researchers in general. Because it is imperative that biomedical equipment continues to function properly in the next century, the Department of Health and Human Services (HHS) is requesting information about the Year 2000 compliance of medical devices and scientific laboratory equipment manufactured by your company.

Medical devices and scientific laboratory equipment may experience problems beginning January 1, 2000 if the computer systems, software applications, or embedded chips used in these devices and equipment contain two-digit fields for year representation.

Agencies, such as the Department of Defense, Department of Veterans Affairs, and Department of Agriculture as well as HHS, are concerned that the existence of the Year 2000 date problem in biomedical equipment could pose potentially serious health and safety consequences.

On behalf of the Department, I strongly urge you to identify products, which are not Year 2000 compliant, and to detail how and when these products will become compliant. If all your products are compliant, you may provide a statement certifying total compliance of products.

The enclosure provides the address of the web site to which you may link your own web site containing compliance information about your product lines. If you prefer, you may mail noncompliant product information or the total compliance statement to HHS. The mailing address is also listed in the enclosure. All information received will be made available to the public through the government web site, and the public will have full access to the list of manufacturers who respond. In addition, there will be targeted follow-up regarding non-respondents, and cooperation at the onset will save both time and taxpayer dollars.

I know you share our commitment to the uninterrupted provision of our nation's vital patient care services and health research initiatives in the new millennium. Thank you for your cooperation.

Sincerely,

Kevin Thurm

Enclosure

Enclosure to January 21, 1998 Letter to Manufacturers

Medical Device and Scientific Laboratory Equipment
Year 2000 Compliance Information

The Federal Government has established a World Wide Web site to provide information regarding the Year 2000 compliance of medical devices and scientific laboratory equipment. The general public, including government agencies that purchase and use biomedical equipment, and the health care and research communities will have access to this web site. Manufacturers of biomedical equipment are urged to provide the information described below regarding the Year 2000 compliance status of their products, including both current and previously manufactured products.

For the purpose of this product status reporting, Year 2000 compliant means, with respect to medical devices and scientific laboratory equipment, that the product accurately processes and stores date/time data (including, but not limited to calculating, comparing, displaying, recording and sequencing operations involving date/time data) during, from, into and between the twentieth and twenty-first centuries, and the years 1999 and 2000, including correct processing of leap year data.

The above definition is a slight modification of the definition of "Year 2000 Compliance" as used in the Federal Acquisition Regulations for information technology products to address medical devices and scientific laboratory equipment (see 48 CFR Part 39.002). The intent is that for products to be Year 2000 compliant they must function as intended or expected, regardless of the date. A manufacturer's reporting of Year 2000 compliance status should include all products (units) produced which could still be in service.

Manufacturers are requested to provide one of the following two items of information.

- **A certification that all of the manufacturer's products are Year 2000 compliant or a certification that the date problem is not applicable to any of their products. (This certification can only be made if the manufacturer has assessed the compliance status of all products. Otherwise, a status of AI (see below) with date must be reported for those products not yet assessed.)**
- **A listing of products which have Year 2000 compliance problems (are not compliant under the definition given above) with sufficient information to identify the specific product (as described below).**
    - Type of product (Generic description of product. For medical devices, the generic type of device as used in the device classification regulations of 21 CFR Parts 860 - 892 may be an appropriate description.)
    - Owner/Operator Number if manufacturer is an FDA regulated firm
    - Original manufacturer (if different from company providing information)
    - Model number
    - Specific serial numbers (if appropriate)
    - Software version number
    - Brief description of the date-related problem
    - Solutions to be offered by manufacturer to mitigate problem - one of the following codes should be used to indicate solution to be provided for the product
        - SU/date - Upgrade to software will be available by (date) at no cost to purchaser.
        - SU-C/date - Upgrade to software will be made available by (date) at a cost to purchaser.
        - HU/date - Upgrade to product (hardware and software) will be made

available by (date) at no cost.
- HU-C/date - Upgrade to product (hardware and software) will be made available by (date) at a cost.
- M - Minor date-related problem with product, presenting no adverse health impact on product function and for which manufacturer will not provide a correction/upgrade.
- O - Product is obsolete or beyond reasonable useful service life and no upgrade will be provided.
- AI/date - Assessment of compliance status is currently incomplete but is underway and information will be made available by (date).

- Point of contact to discuss product information (including name, address, telephone number, fax number, and e-mail address)

The information may be provided using one of the following methods.

- **Posting the noncompliant product information or the certification of total product compliance on a manufacturer operated web site and providing the URL for the web site to the FDA at either of the addresses given below.** The FDA will incorporate a link to the manufacturer's web site from the government maintained site providing the product Year 2000 compliance data. A condition imposed by the government on providing this link is that the link be directed to a portion of the manufacturer's web site which directly provides the full data elements or certification described above and not to a page providing other types of information or product promotion.
- **Submitting information directly to FDA electronically by completing the data entry form provided on the government web site at http://www.fda.gov/cdrh/yr2000/y2kform.html using the USER ID = and the PASSWORD = (ID and password contained in letter sent to manufacturers only).**
- **Mailing the noncompliant information or certification of total product compliance to the address listed below, for posting by the government on the government web site.**

Mailing address:

Food and Drug Administration
Attn: Y2K Medical Devices Coordinator
Center for Devices and Radiological Health
Mail Code HFZ-Y2K
9200 Corporate Boulevard
Rockville, MD 20850

In order to best serve the industry, as well as recognizing the limited time available

before the Year 2000, we ask all manufacturers to respond within **sixty days**. The provision of information, by either of the methods described above for posting on the government web site, signifies that the information provided is true and complete and covers all of the manufacturer's products to the best of the manufacturer's knowledge. Manufacturers who are unsure of the status of a product should report it as code AI until the assessment is completed.

The request for web site posting of product information on noncompliance status or total compliance certification is designed to provide an opportunity for manufacturers to communicate and better serve customers in a responsible and proactive manner, and avoid the necessity for manufacturers and vendors to field numerous calls and letters from individual organizations. The information you provide will prevent Year 2000 problems from endangering the nation's patient care and health research activities.

The public will be informed via the web page that:

There is no assurance that manufacturers who fail to respond to this request are Year 2000 compliant.

The information that resides on this web site has been provided by the manufacturers of biomedical equipment. Users or potential purchasers of equipment should independently verify compliance of specific, critical products.

If you have questions regarding this survey or web site, you may contact Gayle Finch, Director of the Office of Information Technology Planning and Investment, Office of the Secretary on 202-690-5515. Questions on technical aspects of data submission or electronic communications should be addressed to Stuart Carlow, Director of the Division of Information Dissemination, Center for Devices and Radiological Health, FDA at 301-594-4754 or via e-mail to sac@cdrh.fda.gov.

Year 2000 Impact on Biomedical Equipment Home page

(Updated September 22, 1998)